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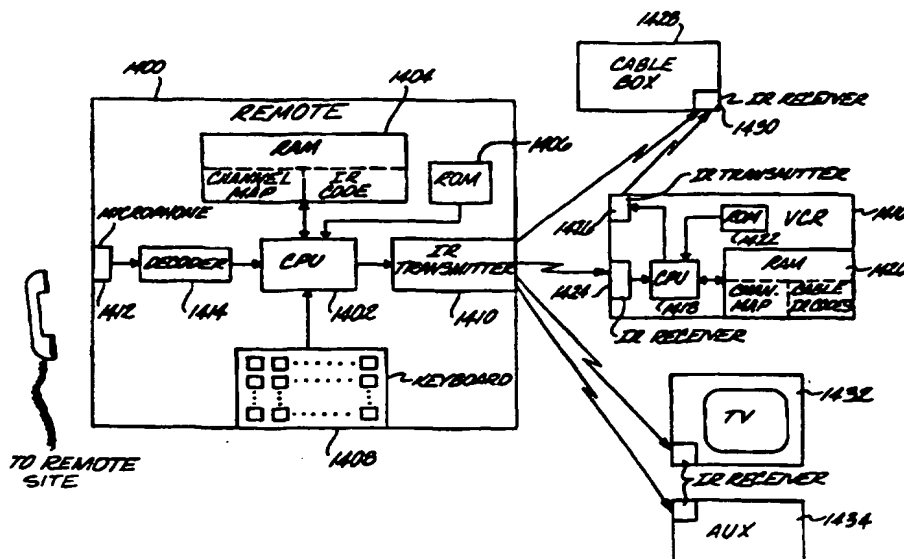
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(54) Title: TELEPHONE APPARATUS AND METHODS USING COMPRESSED CODES



## (57) Abstract

A telephone set includes a decoder (1414) for decoding compressed codes of as few as 1 to 8 digits, which are compressed in length from the combination of channel, time-of-day and length information. A clock for providing an output as a function of time is integral to the telephone set and the telephone set includes a means for transmitting commands to an appliance, such as a recorder (1416). The telephone set commands the recorder to turn on in response to comparison of the decoded time-of-day commands with the clock output and commands the selection of a channel of the information broadcast to record to turn off in response to comparison of the record on time with the decoded length commands. In one embodiment the telephone set includes a cordless telephone. Methods are provided for downloading initial setup data from a remote site and for remotely entering compressed codes via telephone.

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TELEPHONE APPARATUS AND METHODS USING COMPRESSED CODES5  
**Background of the Invention****Field of the Invention:**

10 This invention relates generally to video cassette recorder systems and telephone sets and particularly to apparatus and methods for using encoded information with a telephone set to shorten the time required to perform timer preprogramming and for remotely controlling various appliances, such as a video cassette recorder, and for easily performing an initial setup routine of such an apparatus.

**Description of the Related Art:**

15 The video cassette recorder (VCR) has a number of uses, including playing back of tapes filmed by a video camera, playing back of pre-recorded tapes, and recording and playing back of broadcast and cable television programs.

20 To record a television program in advance of viewing it, a two-step process is often used: (1) obtain the correct channel, date, time and length (CDTL) information from a television program guide, and (2) program this CDTL information into the VCR. Depending on the model, year and type of the VCR, the CDTL information can be programmed in various ways including: (i) pushing an appropriate sequence of keys in the console according to instructions contained in the user's manual, (ii) pushing an appropriate sequence of keys in a remote hand-held control unit according to instructions contained in the user's manual (remote programming), and (iii) executing a series of keystrokes in the remote hand-held control unit in response to a menu displayed on the television screen (on-screen programming). Other techniques for timer preprogramming have been suggested including: (iv) reading in certain bar-code information using a light pen (light pen programming), and (v) entering instructions through a computer or telephone modem. These various methods differ only in the physical means of specifying the information while the contents, being CDTL and certain power/clock/timer on-off commands are generally common although the detailed protocol can vary with different model VCRs. Methods (i) and (ii) described above can require up to 100 keystrokes, which has inhibited the free use of the timer preprogramming feature of VCRs. To alleviate this, new VCR models have included an "On-Screen Programming" feature, which permits remote input of CDTL information in response to a menu displayed on the television screen. Generally on screen programming of CDTL information requires an average of about 18 keystrokes, which is less than some of the prior methods but still rather substantial. Some of the other techniques such as (iv) above, require the use of special equipment such as a bar code reader.

35

1 In general the present state of the art suffers from a number of drawbacks. First, the  
procedure for setting the VCR to record in advance can be quite complex and confusing and  
difficult to learn; in fact, because of this many VCR owners shun using the timer  
5 preprogramming record feature. Second, the transcription of the CDTL information to the  
VCR is hardly ever error-free; in fact, many users of VCR's timer preprogramming features  
express concern over the high incidence of programming errors. Third, even for experienced  
users, the process of entering a lengthy sequence of information on the channel, date, time  
and length of desired program can become tedious. Fourth, techniques such as reading in  
10 bar-code information or using a computer require special equipment. These drawbacks have  
created a serious impediment in the use of a VCR as a recording device for television  
programs. The effect is that time shifting of programs has not become as popular as it once  
was thought it would be. Accordingly, there is a need in the art for a simpler system for  
effecting VCR timer preprogramming which will enable a user to take advantage of the  
recording feature of a VCR more fully and freely.

### 15 Summary of the Invention

A principal feature of the invention is providing an improved system for the selection  
and entering of channel, date, time and length (CDTL) information required for timer  
preprogramming of a VCR which is substantially simpler, faster and less error-prone than  
present techniques. Another principal feature of the invention is providing televisions having  
20 an embedded capability for timer programming control.

In accordance with the invention, to program the timer preprogramming feature of a  
video system, there is an apparatus and method for using encoded video recorder/player  
timer preprogramming information. The purpose is to significantly reduce the number of  
keystrokes required to set up the timer preprogramming feature on a VCR. In accordance  
25 with this invention it is only necessary for the user to enter a code with 1 to 8 digits or more  
into the VCR. This can be done either remotely or locally at the VCR. Built into either the  
remote controller or the VCR is a decoding means which automatically converts the code into  
the proper CDTL programming information and activates the VCR to record a given  
television program with the corresponding channel, date, time and length. Generally multiple  
30 codes can be entered at one time for multiple program selections. The code can be printed  
in a television program guide in advance and selected for use with a VCR or remote  
controller with the decoding means.

A product embodying these features is now commercially available and has enjoyed  
great commercial success. This instant programmer, sold under the VCRPlus+® trademark,  
35 consists of a handheld unit into which compressed codes (each 1 to 8 digits long) for  
television programs to be recorded are entered. The compressed codes are most commonly  
found in printed television listings. The instant programmer decodes the compressed codes  
into channel, date, time-of-day and length commands which are then stored in the

1 programmer's memory. When date and time of the program in the memory that is scheduled  
the nearest to the current time coincides with the current time, as determined by an internal  
clock, the instant programmer, using an infrared transmitter and universal remote technology,  
5 sends infrared remote control signals to a cable box or a video recorder to change the  
channel to the correct channel and infrared remote control signals to a video recorder to turn  
the recorder on and begin recording. After the length for the program, stored in memory,  
has elapsed, an infrared remote control signal to stop recording is sent to the video recorder.

Before the VCRPlus+ programmer can be used, the user must perform an initial setup  
procedure. This procedure includes entering the brands and models of the user's video  
10 recorder and cable box into the programmer, setting the clock in the programmer, and  
entering a local channel map which maps "national" channel numbers for certain networks  
and cable channels into the actual channel numbers used for these channels by the user's  
cable system. The instant programmer is manufactured with the infrared codes necessary to  
remotely control a wide variety of cable boxes and video recorders stored in ROM. The  
15 model and brands of the cable box and video recorder must be entered so that the instant  
programmer will use the correct ones of the infrared codes stored in ROM for the user's  
particular video recorder and cable box

A parent application to the present application includes an improvement to the video  
recorder with a built in instant programmer and remote control transmitter that involves  
20 downloading data over telephone lines from a remote site to the video recorder. In several  
embodiments the information downloaded is initial setup data that otherwise would have to  
be manually keyed in by the user. Instead, the user can call a customer service  
representative on the telephone and orally give the representative the information necessary  
to perform the initial setup. The representative then enters the necessary information into  
25 a computer which, in turn, downloads the data over the telephone line to the video recorder  
which has been connected to the telephone line. In various embodiments, the video recorder  
is connected to the telephone line by a modular phone jack in the video recorder or through  
the telephone's earpiece which is held in the proximity of a microphone connected to the  
video recorder. In other embodiments, data is downloaded first over a telephone line into  
30 a VCR remote controller, instead of into the video recorder directly, in any of the ways that  
the data can be transmitted to the video recorder. Thereafter, the data is retransmitted from  
the VCR remote control to the video recorder through infrared remote control signals  
transmitted by the VCR remote and received by the video recorder.

In any of these embodiments, the initial setup data is transferred and stored into the  
35 video recorder or remote controller without the user having to key the information manually.

A principal object of the present invention is to embed the decoding means into a  
telephone set. The telephone set at the appropriate times, distributes the proper commands  
to appliances including a VCR, cable box, television, and/or satellite receiver to record

1 selected programs. Controls on the telephone set are used to enter codes that signify the  
program to be recorded and are compressed in length from the individual commands for  
channel, date, time-of-day and length. The normal touch-tone keypad of a telephone set can  
5 be used to enter the numbers of the code. Other controls are provided on the telephone set  
to perform normal television control functions, such as channel selection and volume control.  
When the codes are entered into the telephone set, the codes are decoded into CDTL  
information. Then, at the appropriate time, the telephone set transmits the proper commands  
to a VCR, cable box television and/or satellite receiver to command the recording of the  
selected program. This control function is carried out by using an infrared link from the  
10 telephone set to the VCR, television, cable box and satellite receiver.

Another principal object of the present invention is to provide a telephone set  
comprising a telephone base unit and a cordless telephone, which can be inserted into the  
telephone base unit to charge the batteries in the cordless telephone. An RF link is provided  
between the cordless telephone and the telephone base unit. The RF link can also be used  
15 to control various appliances. Controls on the telephone base unit or the cordless telephone  
are used to enter compressed codes for CDTL information and to review or cancel codes  
already entered. The entered codes can be transmitted from the cordless telephone to the  
telephone base unit via the RF link between the cordless telephone and the telephone base  
unit. The telephone base unit or the cordless telephone decodes the codes into CDTL, which  
20 can be transmitted between the cordless telephone and the telephone base unit. For example,  
the telephone base unit can retransmit the CDTL information back to the cordless telephone  
for review by a user at a remote distance from the telephone base unit.

The telephone base unit is located near the VCR and cable box and any other audio  
and/or video equipment to be controlled, such as a satellite receiver or a television. The  
25 telephone base unit can be connected directly to wall power and to a telephone line or  
alternatively the telephone base unit could be a cellular phone with batteries and a cellular  
RF antenna. The telephone base unit contains IR transmitters capable of transmitting in  
multiple directions such as front, back, left, right, and up, which helps to insure that an  
infrared link will be established between the telephone base unit and the VCR, cable box,  
30 satellite receiver and/or television to be controlled.

Another objective of the present invention is to provide a method for downloading  
initial setup data from a remote site to the telephone set containing the decoder for  
compressed codes. The user calls a representative at a remote site and describes his  
equipment, and then the representative enters that into a computer and the computer  
35 downloads the initial setup data directly over the telephone network to the telephone set  
containing the decoder and the initial setup data is stored within the telephone set.

Another objective is to allow a user to enter the compressed codes for selected  
programs from a remote site directly into the telephone set. The telephone set contains logic

1 to allow it to answer the telephone after a predetermined set of rings. The telephone set also  
contains a voice generation capability that is used to ask the caller to enter a password. If  
a correct password is entered, then the voice generation is used to ask the user to enter a  
compressed code for a selected program. The telephone base unit then stores the compressed  
5 code and then decodes the compressed code to CDTL to control the recording of the selected  
programs.

Yet another objective of the present invention is to provide a telephone set that is able  
to automatically command an audio apparatus to lower the volume when the telephone is  
answered. The telephone set can send the commands via the infrared transmitters built into  
10 the telephone set. The volume of the audio apparatus can be lowered to a predetermined  
volume or the audio apparatus could be commanded to mute the audio. When the telephone  
set determines that a call has been terminated in the telephone base unit, then the telephone  
set can send a command to raise the volume of the audio apparatus. The audio apparatus to  
be controlled can include video cassette recorders, television sets, radios, and stereo  
15 equipment.

Another objective of the present invention is to provide apparatus and methods for  
accessing a telephone number embedded in a television program and dialing the telephone  
number. In one embodiment, program related information is embedded in the vertical  
blanking interval (VBI) line of a television signal and displayed on a television monitor. The  
20 program related information is transmitted from the television set or a video cassette recorder  
having a VBI decoder to the telephone set. The program related information could be a  
telephone number to be used to obtain more information for an item that is being advertised  
or for ordering the item being advertised. Once the telephone number is stored in the  
telephone set, then the user can operate the telephone set to recall the telephone number from  
25 storage and display the telephone number again on either a television monitor or on a display  
on the telephone set. Then, if the user chooses, the user can push a button on the telephone  
set to automatically dial the number.

Other objects and many of the attendant features of this invention will be more readily  
appreciated as the same becomes better understood by reference to the following detailed  
30 descriptions and considered in connection with the accompanying drawings in which like  
reference symbols designate like parts throughout the figures.

#### Brief Description of the Drawings

FIG. 1 is a perspective view of an apparatus for using compressed codes for recorder  
preprogramming according to a preferred embodiment of the invention;

35 FIG. 2 is a bottom view of the apparatus of FIG. 1 showing a microphone hole and  
two electrical contact holes;

FIG. 3 shows the apparatus of FIG. 1 being used in conjunction with a telephone;

1       FIG. 4 is a schematic showing an apparatus for using compressed codes for recorder preprogramming according to a preferred embodiment of the invention;

FIG. 5 is an alternate schematic showing second apparatus for using compressed codes for recorder preprogramming according to a preferred embodiment of the invention;

5       FIG. 6 is a block diagram of a system for downloading initial setup data from a remote site, through a remote control, to a video recorder capable of controlling other devices, according to a preferred embodiment;

FIG. 7 is a flow diagram of a method for downloading initial setup data from a remote site, through a remote control, to a video recorder, according to a preferred embodiment;

10       FIG. 8 is a block diagram for an alternative embodiment of the system shown in FIG. 6;

FIG. 9 is a block diagram for an alternative embodiment of the system shown in FIG. 6;

15       FIG. 10 is a block diagram for an alternative embodiment of the system shown in FIG. 6;

FIG. 11 is a diagram of a system for downloading television program data to a telephone downloadable programmer for control of video recorders and channel selectors;

FIG. 12 is a flow diagram showing the operation of the system shown in FIG. 11;

20       FIG. 13 is a perspective view of a telephone set having a decoder for decoding compressed codes for recorder programming and showing a cordless telephone mounted in a telephone base unit according to an embodiment of the invention;

FIG. 14 is a perspective view of the telephone base unit of FIG. 13 with the cordless telephone removed and showing built-in infrared transmitters according to an embodiment of the invention;

25       FIG. 15 is a perspective view of the cordless telephone of FIG. 13 showing batteries and an infrared transmitter in the cordless telephone according to an embodiment of the invention;

FIG. 16 is a bottom or base view of the apparatus shown in FIG. 15 according to an embodiment of the invention;

30       FIG. 17 is a perspective view showing a manner of placing the telephone base unit of FIG. 14 relative to a video cassette recorder, cable box and television sets according to an embodiment of the invention.

FIG. 18 is a schematic of a cordless telephone having an embedded code decoder means according to an embodiment of the invention;

35       FIG. 19 is a schematic of a telephone set having an embedded code decoder means. The telephone set of FIG. 19 can be a telephone base unit as shown in FIG. 17 or a conventional telephone set according to an embodiment of the invention;



1           FIG. 20 is block diagram of a system for controlling a VCR, cable box, satellite receiver, and television from a telephone set comprising a telephone base unit and a cordless telephone according to an embodiment of the invention;

5           FIG. 21 is a flow diagram of a method for downloading initial setup data from a remote site to a telephone set according to an embodiment of the invention;

          FIG. 22 is a flow diagram of a method for downloading selected television program codes to a telephone set for control of the recorder programming according to an embodiment of the invention;

10          FIG. 23 is a flow diagram of a method for allowing a user to remotely enter a compressed code for recorder programming according to an embodiment of the invention;

          FIG. 24 is a flow diagram showing a method for a telephone set to control the volume of audio apparatus when the telephone set is answered according to an embodiment of the invention;

15          FIG. 25 is a schematic showing a television raster scan and showing the vertical blanking interval lines during the retrace from the bottom of the screen to the top of the screen;

20          FIG. 26 is a diagram showing the vertical blanking interval lines and showing that a vertical blanking interval line may contain information including: channel specific program guide (CSPG), which is a television program guide specific to a particular channel; program related information (PRI), which can also be referred to as instant info (IINFO), both of which can provide information such as a telephone number or a sports score related to a broadcast; a video magazine (V(m)) packet, which can contain may types of information; a TPA packet, containing a tape identification, a program number, and an absolute address; and a directory, which contains a listing of programs recorded on a tape or being broadcast for recording.

25          FIG. 27 is a block diagram of a VCR including a vertical blanking interval line decoder, a character generator, a memory for containing a directory of programs stored on a tape, a microcomputer for allowing programs to be accessed on a tape, an infrared receiver, and an infrared transmitter according to an embodiment of the invention;

30          FIG. 28 is a diagram showing a portion of a tape with TPA packets and a directory written in the vertical blanking interval lines according to an embodiment of the invention;

          FIG. 29A is a diagram showing the format of a TPA packet comprising a tape identification field, a program number field and a absolute address field according to an embodiment of the invention;

35          FIG. 29B is a diagram showing the format of a directory written in vertical blanking interval lines comprising a program title, a program number, a start address, an end address, the record speed, and additional fields for other information such as a program description according to an embodiment of the invention;

1        FIG. 30 is block diagram showing a telephone base unit and a cordless telephone that  
can control a VCR, a cable box, a satellite receiver and a television and also showing a VCR  
that can transmit information accessed from the vertical blanking interval lines of a television  
5        signal to the telephone base unit and/or cordless telephone according to an embodiment of  
the present invention;

FIG. 31 is a block diagram showing a telephone base unit in series between a VCR  
and a television set, the telephone base unit and the cordless telephone having the capability  
of controlling a VCR, cable box, satellite receiver, and television set according to an  
embodiment of the invention; and

10       FIG. 32 is a flow diagram of a method for accessing a telephone number from a  
television signal and dialing the number according to an embodiment of the present invention.

#### **Detailed Description**

Referring now to the drawings, and more particularly, to FIGS. 1 and 2, there is shown  
custom programmer 1100 for using compressed codes for a recorder programming. The  
15       custom programmer 1100 has number keys 1102, which are numbered 0-9, a CANCEL key  
1104, a REVIEW key 1106, a WEEKLY key 1108, a ONCE key 1110 and a DAILY (M-F)  
key 1112, which are used to program the custom programmer 1100. A lid normally covers  
other keys, which are used to setup the instant custom programmer 1100. When lid 1114  
is lifted, the following keys are revealed, but not shown in the drawings: SAVE key,  
20       ENTER key, CLOCK key, CH key, ADD TIME key, VCR key, CABLE key, and TEST  
key. Also included in the custom programmer 1100 shown in FIG. 1 are: liquid crystal  
display 1134, red warning light emitting diode 1132 and IR diodes 1134.

The custom programmer operates essentially the same as the instant programmer of  
U.S. patent 5,335,079, which is incorporated herein by this reference as though set forth in  
25       full.

When using the instant programmer described in U.S. Patent 5,335,079, the consumer  
initially performs a set-up sequence, consisting of selecting a protocol for the model/brand  
of VCR, setting the current real time, selecting a protocol for the model/brand of cable box,  
and entering a series of channel number assignments. Although the instant programmer  
30       makes recording of television programs extremely simple, the initial set-up sequence for the  
instant programmer is more complex and deters the use of the instant programmer by some  
consumers. Custom programmer 1100 includes a microphone opening 1140 through which  
at least one microphone inside the custom programmer 1100 can receive electronically coded  
audio signals that contain the information necessary for the custom programmer's initial  
35       set-up and commands to store this information into the custom programmer 1100.

In order to receive these audio signals, a user may call a special phone number which  
could be a toll-free 800 number, a pay-per-minute 900 number, or a standard telephone  
number with standard toll charges applying. The consumer can speak to an operator who

1 orally inquires from the consumer the information regarding the consumer's VCR model and  
brand, zip code, cable company, model and brand of cable box and the newspaper or other  
publication which the consumer will use to obtain the compressed codes. This is all the  
5 information needed to perform the initial set-up for the custom programmer 1100. From the  
zip code cable company information, the operator can determine the cable channel line-up  
for the consumer and combine this data with the knowledge of which publication the  
consumer will use to select the correct local channel mapping table for the consumer.

The operator then directs the consumer to press a designated programming key which  
is, in the case of the preferred embodiment, the CH key located under lid 1114. When the  
10 CH key is pressed, the display 1134 with display the message "PHONE1 KEY2". Pressing  
the "2" numeric key places the custom programmer into the manual local channel table  
programming mode that is implemented by instant programmer when CH key 322 is pressed.  
Pressing the "1" numeric key initiates the remote programming mode. The custom  
programmer 1100 is then ready to receive an audio signal and display 1134 displays the  
15 message "WAIT".

The operator will then direct the consumer to place the earpiece 1142 of the telephone  
receiver 1144 over the microphone opening 1140 of the custom programmer 1100 as  
generally shown in FIG. 3. The earpiece need not be placed directly against the custom  
programmer 1100, but may be held more than an inch away from the microphone opening  
20 with generally satisfactory results. After a pause sufficient to allow the consumer to place the  
telephone receiver in the proper position, the operator will initiate the downloading of the  
initial set-up data and initial set-up programming commands transmitted over the telephone  
line 1146 using audio signals to the consumer's custom programmer 1100.

If the initial set-up data is successfully transferred to the custom programmer 1100,  
25 the display 1134 of the custom programmer 1100 will display the message "DONE". If the  
reception of the initial set-up data is not successful within a predetermined time limit, red  
warning light emitting diode 1132 will blink to inform the consumer to adjust the position  
of the telephone earpiece before another down load of the information is attempted. After  
a waiting period allowing this adjustment, the initial set-up data and commands are re-  
30 transmitted over the telephone line. If after a predetermined number of attempts to download  
the initial set-up information are unsuccessful, the liquid crystal display 1134 displays the  
message "FAIL" and the operator is again connected to the consumer allowing the operator  
to speak to the consumer to provide additional assistance in the positioning of the telephone  
earpiece.

35 Alternatively, a live operator can be provided by the local cable company and the  
initial set-up information downloaded to the custom programmer 1100 by telephone line,  
through the existing cable of the cable system, or any other transmission means. If local  
cable companies supply the live operators, the only information they would need to gather

1 from the consumer would be the VCR brand and model and the publication containing  
compressed codes that the consumer plans on using, because the local cable company would  
know the model and brand of cable box installed at the consumer's location and the necessary  
data regarding the local channel designations for that cable system.

5 FIGS. 4 and 5 are schematics of the circuitry needed to implement alternative  
embodiments of the custom programmer 1100. The circuit consists of microcomputer 1150,  
oscillator 1152, liquid crystal display 1154, keypad 1156, compressed code decoder 1153,  
five way IR transmitters 1158 and red warning light emitting diode 1160. The functions of  
these components are described in U.S. Patent 5,335,079. In particular, the compressed  
10 code decoder 1153 is a decoder for compressed codes each having at least one digit  
representative of, and compressed in length from, a channel, time-of-day, and length for a  
program. U.S. Patent No. 5,335,079 describes the use of the compressed codes for recorder  
programming.

In both FIGS. 4 and 5, earpiece 1142 generates serial audio signals which are received  
15 by microphone 1162. As shown in FIG. 4 the audio signals received by microphone 1162  
are passed through amplifier 1164 and forwarded through a decoder circuit 1165 which can  
be a DTMF decoder, and into a serial port of microcomputer 1150. In the alternative circuit  
shown in FIG. 5, the audio signals received by microphone 1162 are passed through  
amplifier 1165, through a band pass filter 1168 with a cutoff at approximately 1 - 4 kHz, and  
20 through a second amplifier 1170 to a serial port of microcomputer 1150.

Alternatively, a dual microphone system (not shown) may be employed to increase  
reliability, especially when the custom programmer 1100 is to be programmed in an  
environment with a high level of background noise that could interfere with the transmission  
of data through the single microphone acoustic means. In this system, one microphone is  
25 placed near the telephone earpiece and the second microphone is placed some distance away  
from the earpiece in order to pick up background noise. An audio signal cancellation circuit  
is then used to effectively "subtract" the background noise picked up by the second  
microphone from the audio data signals combined with the background noise that is picked  
up from the first microphone resulting in solely clean audio data signals.

30 In an alternate embodiment, a VCR remote 1400 is also a universal remote as well as  
having all the functions of custom programmer 1100. Thus, the VCR remote is capable of  
controlling the cable box 1428, VCR 1416, television 1432 and any other auxiliary home  
electronic equipment 1434 that is IR remote controllable.

A significant advantage of the VCR remote controller 1400 is that the data required  
35 to be entered into the VCR 1416 for the initial setup can initially be downloaded from a  
remote site by telephone to the VCR remote controller in the same manner as for custom  
programmer 1100. To do this, the consumer calls the remote site by using the telephone,  
and orally gives the information necessary to perform the initial setup to a person at the

1 remote site. The person at the remote site then instructs the consumer to place the telephone  
earpiece near the microphone of the VCR remote and the initial setup is downloaded.  
Thereafter, the user easily causes the data to be downloaded by IR transmission from the  
VCR remote control to the VCR itself by pressing a "send" key or a "send" sequence of  
5 keys. The VCR receives the initial setup data, stores it in its memory 1420 and then is ready  
to be used as an instant programmer.

In an alternative embodiment, shown in FIG. 8 the structural elements of the custom  
programmer 1100 shown in FIGS. 1-5, including a microphone 1450 and decoding assembly  
1452, are embedded within a VCR 1454. In this embodiment, the user holds the telephone  
10 earpiece 1456 to the microphone embedded in the VCR to download the initial setup data  
directly from the remote site into the VCR. The difficulty with this embodiment is that often  
a user's VCR and telephone are not located close enough together to position the telephone  
earpiece near the VCR. Further, correction of this problem, which would involve adding  
an extension cord to the telephone or disconnecting and relocating the VCR nearer the  
15 telephone are not convenient.

In another embodiment, shown in FIG. 9, the microphone in the VCR with custom  
programmer embedded is replaced with a modular phone jack 1458 that leads directly to the  
decoder assembly 1452 in the VCR. A standard telephone line 1460 would then connect the  
VCR to a modular T-connector 1462 so that both the VCR and an independent telephone  
20 1464 are connected to the telephone line 1466. The consumer then uses the telephone to call  
and talk to the remote site, but the data is transmitted directly to the VCR. The transfer of  
data by this method may be more accurate than transmission by audible tones. However, this  
embodiment suffers from the same problem of the proximity of the consumer's phone outlets  
to the VCR.

25 With the embodiment shown in FIG. 6, though, the proximity of the VCR to a  
consumer's telephone or telephone jack is not important. The consumer simply carries the  
remote to his or her phone and gets the initial setup data downloaded into the VCR remote.  
The consumer then carries the remote to a location near the VCR and downloads the initial  
setup data to the VCR.

30 In another embodiment, the VCR remote, shown in FIG. 6, operates as a relay station,  
translating the audio signals from the telephone directly into IR pulses beamed at an  
appliance, such as a VCR or a TV.

Another embodiment, shown in FIG. 10, is to install a modular jack 1466 into the  
VCR remote 1400. In this embodiment, the VCR remote is connected to the telephone by  
35 a T-connector 1468 and operates in the same way as the VCR with a built in modular jack  
described above and shown in FIG. 9 except that after the initial setup data is transferred to  
the VCR remote, the VCR remote is placed near the VCR and the initial setup data is  
downloaded by IR transmission to the VCR. One advantage that this embodiment has over

1 the VCR with a built in modular jack is that the VCR remote can be taken to the telephone  
whereas the VCR may be located far from the telephone. It is also possible to add a DTMF  
generator to the VCR remote so that the keypad 1408 of the VCR remote can be used to dial  
5 the telephone number of the remote site. Alternatively, telephone numbers for the remote  
site are stored in the memory of the VCR remote so that the consumer may dial the remote  
site by pressing a minimum number of keys.

The details of the operation of the VCR remote and similarly the custom controller  
1100 are as follows. In the first step, shown in block 1440 of FIG. 7, the consumer places  
a telephone call on either an 800, 900 or normal toll call line to a customer service  
10 representative. In block 1442, the representative inquires from the consumer information  
necessary to perform the initial setup, such as the consumer's ZIP code or the name of the  
consumer's cable company, the television guide that consumer uses, the brand and model of  
the consumer's cable box (it is sometimes possible to deduce this data from the ZIP code or  
cable company name data) and the brand and model of the consumer's VCR. As with the  
15 initial setup of the custom programmer, the channel map and cable box IR codes can be  
determined from this data. If the VCR remote control is also a universal remote control, the  
representative inquires as to the brands and models of any other IR controllable home  
electronic equipment that the consumer may wish to control with the VCR remote control.

Once the channel map and IR code data to be downloaded have been identified in  
20 block 1442, the initial setup data, including the channel map, IR code data and the current  
time, including the date, is downloaded over the telephone line to the VCR remote control.  
In the preferred embodiment, the initial setup data is generated by a computer at or connected  
to the representative's location, transmitted over telephone lines, received by the VCR remote  
control's microphone or modular phone jack and decoder, and stored into RAM 1404 by  
25 CPU 1402.

In block 1448, the consumer presses a "send" key or a sequence of keys that triggers  
the transmission of the initial setup data through the IR transmitter to the VCR's IR receiver.  
If the VCR remote control is a universal remote, the IR codes for IR controllable devices  
other than the cable box are preferably not transmitted to the VCR as they are used by the  
30 VCR remote control itself, not the VCR. The data is stored by the VCR's CPU into the  
VCR's RAM.

In an alternative embodiment, the VCR remote control's IR transmitter is not a multi-  
directional or wide angle IR transmitter. The more expensive multi-directional or wide angle  
IR transmitters are not necessary because the IR transmitter is not used to transmit IR signals  
35 when the VCR remote control is set on a table or on top of the cable box or VCR.

In any case, in the preferred embodiment, a multi-directional or wide angle IR  
transmitter is retained to increase the likelihood of the successful downloading of all of the  
initial setup data. Although the quantity of the initial setup data is not tremendous, it is

1 substantial. Thus, an uninterrupted IR stream of a significant duration is required to reach the VCR from the VCR remote control. The more diverse the radiation of IR signals is, the more likely it is that all of a stream of IR signals will reach the IR receiver in the VCR, either directly or by reflection.

5 For preexisting VCRs with a built in instant programmer and IR transmitter that were made before the present VCR remote controller and that can also have their initial setup performed through the use of a remote control, the VCR remote controller can be programmed, either with a program stored in ROM at manufacture or by telephone into RAM, to use the preexisting VCRs own protocol for initial setup using a remote controller.  
10 In other words, the VCR remote control is programmed to mimic a consumer using the VCR's original remote controller to perform the initial setup.

In VCRs designed specifically for use with the VCR remote controller, a special protocol, designed to reduce the length of the IR transmission sent to the VCR is used. In an alternative embodiment, part of this special protocol includes using a receipt confirmation  
15 signal combined with known error detection and/or error correction schemes to assure the reception of the entire stream of initial setup data by the VCR. Known error detection schemes that can be used include using a parity check bit in every byte of data and embedding a code at some point in the data stream that indicates the length of the entire data stream. The use of these and other known error detection and correction schemes allows the  
20 VCR to verify whether the complete stream of error free initial setup data was received. If it is verified that the data received is correct and complete, the VCR can produce an indication, either audio or visual, that the initial setup data was successfully received. If it is not verified that the data received is correct and complete, the VCR either gives no indication or produces a second indication to indicate an unsuccessful transmission. Upon  
25 an unsuccessful transmission, the consumer adjusts the position of the VCR remote control relative to the VCR and retransmits the initial setup data.

Another alternative is to provide modular telephone jacks in both the VCR and the VCR remote control for downloading the initial setup data from the VCR remote control to the VCR. This embodiment provides for more error free transmission of the initial setup  
30 data, but forces the consumer to connect, disconnect and store the cable that links the VCR remote control and the VCR.

Yet another alternative is to include in the VCR a microphone and decoder assembly similar to the microphone and decoder assembly 1412-1414 in the VCR remote control. An encoder and speaker (not shown) are then added to the VCR remote control. With this  
35 alternative embodiment the initial setup data is transmitted from the VCR remote control to the VCR using the same type of audio signals as used to download the initial setup data over the telephone lines to the VCR remote control. When the consumer is ready to transmit the initial setup data from the VCR remote control to the VCR, he or she simply holds up the

1 speaker of the VCR remote control to the microphone of the VCR and presses the keys  
necessary to trigger transmission. In the preferred embodiment of this alternative, with  
current speaker and microphone technology, the speaker and microphone on the VCR remote  
control can be combined into a single microphone/speaker component.

5 In the downloading process of blocks 1446-1451 of FIG. 7, the channel map data and  
IR code data for the VCR is transmitted and stored into the RAM of the VCR remote control  
first. Thereafter the data is retransmitted to the VCR and stored into the RAM of the VCR.  
After transmission to the VCR of the channel map data and IR code data for the VCR is  
completed, the channel map and IR code data for the VCR is erased from the RAM in the  
10 VCR remote control. If IR code data for use by the VCR remote itself is initially  
downloaded with the channel map data and IR code data for the VCR, this data is, of course,  
not erased from the RAM in the VCR remote control.

The IR codes for control of the cable box and other remote controllable electronic  
equipment that are downloaded over a telephone line to the video recorder, either directly  
15 or via a VCR remote, are stored in different ways in different alternative embodiments.  
Thus, IR codes for numerous cable boxes and other devices can be stored in the ROMs of  
the video recorder and the VCR remote with the addresses of the IR codes for a particular  
cable box or other device being downloaded to the RAM of the video recorder or VCR  
remote. Alternatively, the IR codes themselves can be downloaded to the RAM of the video  
20 recorder or VCR remote.

The invention as shown in the various embodiments of the VCR remote 1400 can  
readily be used with televisions, cable boxes, satellite receivers or other components that  
contain remote control transmitters. The only differences in operation in these alternate  
configurations are the IR codes and downloading protocols that the VCR remote uses.  
25 However, the VCR remote as described above is capable of having these codes and protocols  
downloaded by telephone along with the initial setup data.

The initial setup data includes IR codes or IR code addresses for the remote control  
of other electronic equipment, local channel maps and the current time. In addition to initial  
setup data, data representing programs that are desired to be recorded or viewed may be  
30 downloaded to the various telephone downloadable programmers. The downloaded data  
representing a program to be recorded is in the form of the actual values of the channel,  
date, time-of-day and length of the program. Alternatively, the data downloaded representing  
a program to be recorded or viewed, is in the form of a compressed code or G-code, which  
contains the channel, date, time-of-day and length of the program.

35 The physical configuration of this embodiment for downloading program information  
is shown in FIG. 11. FIG. 12 shows a flow diagram of the process of selecting and  
downloading program information according to this embodiment. In block 1500, the user  
calls a customer service representative 1520 located at a remote site on the telephone, either



1 on a pay-per-minute or pay-per-call 900 number, toll-free 800 number or regular toll  
number. In block 1502, the user orally tells the representative either specific shows that the  
user wants to record or a more general description of a type of show to be recorded or  
5 viewed. Such general descriptions include the type of show, such as situation comedies,  
dramas, action shows, mysteries, police or detective shows, real life rescue, emergency or  
police shows, game shows, news magazines, daily news programs, documentaries, sports  
events, movies, etc. The general descriptions further include more specific descriptions such  
as movies or shows starring a particular actor or actress or directed by a certain director  
(e.g. "all Humphrey Bogart movies"), sporting events involving a particular team and/or a  
10 particular sport (e.g. "all U.C.L.A. basketball games"), a show that may be on multiple  
times a week on different channels (e.g., "all episodes of 'I Love Lucy' on this week").

In block 1504, the representative enters the information given by the user in block  
1502 into a computer 1522. The computer includes a large database of television programs  
to be broadcast in the future, stored in mass storage 1526, such as a hard disk. The  
15 computer then searches the database for television programs that match the information  
entered by the representative and retrieves the channel, date, time-of-day and length data for  
each program matching the information entered. In block 1506, the computer automatically  
checks the date, time-of-day and length data for all the programs retrieved in the database  
search for time conflicts between programs that overlap each other.

20 If there is a time conflict, the computer alerts the representative that there is a time  
conflict and the programs that are involved. In block 1508, the representative informs the  
user of the time conflict and the programs that are conflicting. The user then decides which  
of the conflicting programs he or she wishes to record or view. Alternatively, the user  
chooses to have only the non-conflicting portion of a program that partially conflicts with  
25 another program recorded or viewed to avoid the conflict. For example, if two programs  
are selected that both begin at 8:00 pm on Sunday, but one lasts one hour and the other lasts  
two hours, the user can choose to record the one hour program and the second hour of the  
two hour program. The user tells the representative how to resolve the conflict and, in block  
1510, the representative enters this information into the computer, which adjusts the selected  
30 programs accordingly, in block 1512.

In one embodiment, in block 1514, the computer converts the channel, date, time-of-  
day and length of each of the programs remaining after the search of the database and after  
resolving time conflicts, if any, into G-codes for use by downloadable programmers that  
perform the functions of the instant programmer. Such a programmer is representatively  
35 shown by dotted line 1524 with the programmer 1524 having a CPU 1526, a microphone and  
high pass filter 1528 (similar to programmer 1100 as shown in FIG 44), a random access  
memory (RAM) 1532, which includes a stack memory for storing the CDTL information,  
a ROM 1530, a remote control transmitter 1536 (which is usually an infrared emitter) and

1 a display 1531. In block 1516, the computer downloads the G-codes over a telephone line  
to a telephone downloadable programmer 1524 that performs the functions of the instant  
programmer.

5 In another embodiment, the blocks 1514 and 1516 are replaced by a block (not shown)  
in which the computer downloads data representing the channel, date, time-of-day and length  
of each of the programs selected by the search of the database and modified to resolve time  
conflicts, if any, over a telephone line to any telephone downloadable programmer, such as  
programmer 1524.

10 After program data is downloaded to a telephone downloadable programmer, and  
decoded into channel, date, time-of-day and length if G-codes were downloaded, the CDTL  
data is stored into the memory of any of the telephone downloadable programmers, such as  
stack memory of RAM 1532. After the program data is stored in memory, the control of  
the recording of the programs according to this data is performed in same manner as  
performed by the various telephone downloadable programmers described above.

15 In an alternative embodiment, the program data is downloaded to the telephone  
downloadable programmers for control of a television or cable box only, rather than for  
control of a video recorder. With this embodiment, the user is able to use a telephone  
downloadable programmer to simply change the channel of his or her television or cable box  
to assure that an important show is not missed because the user forgets what time it is or  
20 becomes engrossed in another show or simply because the user does not want to bother  
having to change channels manually.

The format of the database file to store the great amount of information about the  
future television broadcasts of television programs and the database program used to  
manipulate and search the database file can be any well known database format and  
25 corresponding database engine. In the preferred embodiment, the database format used  
consists of a series of records, each consisting of a predetermined set of fields that is the  
same as the set of fields in every other record in the database. Each television program  
corresponds to one record of the database. Each record contains fields for the title, channel,  
date, starting time-of-day and the length of the program. Further, each record includes a  
30 series of boolean fields, each field representing a certain category of television program, such  
as situation comedy, romantic movie, sports program, etc. The advantage of this  
embodiment is that many different categories may be easily represented and searched, while  
taking up little space. This embodiment takes up little space because even though there may  
be over a hundred different category fields, a boolean field usually takes up only one bit or  
35 at most one byte of space for each record in most database file formats. The small size of  
each category field also facilitates rapid searching through the database for all the programs  
in a certain category. This embodiment also allows for multiple overlapping categories. For  
example, the database may have separate category fields for crime subject matter, comedy,

1 and fiction. One television program may be a fictional comedy about crime, thus containing  
a "true" value in all three category fields. On the other hand, a program may be a real life  
drama about crime which only would contain a "true" value in one of these category fields,  
viz. the crime subject matter field.

5 In addition to the boolean category fields, each record includes several "people" fields.  
The contents of the "people" fields include characters in the program, actors and actresses,  
directors and writers involved with the creation of the program. Thus, if a user desires to  
program all programs involving certain people, be they characters, actors or creators of the  
program, the computer can search the "people" fields for this information. Alternatively,  
10 there can be separate fields for characters, actors and actresses, and creators of programs.

Each record also includes fields devoted to the violence and sexual content of the  
television program. In the case of motion pictures, a field for the rating by the Motion  
Picture Association is utilized. In every record, boolean fields for such descriptions as mild  
violence, explicit violence, brief nudity, nudity, profanity, adult situations, and sexual theme  
15 are included. Thus, programs can be selected or excluded from a search based on such  
general content information.

Each record of the database also includes an abstract that contains a brief description  
of the program. This allows a more detailed and extensive search, albeit more time  
consuming, of specific program content by searching all of the abstract fields for certain  
20 keywords or combinations of keywords.

In an alternative embodiment shown in FIG. 13, the functional elements of the instant  
programmer, custom programmer 1100, or remote controller 1400 are embedded within a  
telephone set 1550. In the embodiment shown in FIG. 13, no microphone 1140, as shown  
in FIG. 2, for downloading information from a telephone receiver is required, because the  
25 telephone set with the instant programmer is connected directly to the telephone network, as  
shown by telephone connection 1582. The telephone connection is to a telephone network,  
and the connection can be via telephone lines or via a cellular network. In the embodiment  
shown in FIG. 13, the telephone set comprises a telephone base unit 1554 into which a  
cordless telephone 1552 is inserted. The telephone base unit can hold the cordless telephone  
30 and also charge the batteries of the cordless telephone. A telephone set that does not include  
a cordless telephone is another embodiment that is not shown, but such a telephone set  
operates very similarly to the description that follows for the telephone base unit except there  
would not be a cordless telephone or an RF link to the cordless telephone.

35 The cordless telephone 1552 includes controls 1562 and controls 1564 which  
correspond to the controls 1302 and 1304 of the instant programmer of FIG. 53, or the  
controls on instant programmer 1100. The cordless telephone also includes a display 1566  
corresponding to display 1134 of instant programmer 1100. An antenna 1570 is included on  
the cordless telephone to provide a RF link to the telephone base unit. An infrared

1 transparent cover 1568 covers an infrared transmitter and in one embodiment also an infrared receiver.

5 The telephone base unit 1554 includes controls 1578 and 1576 which correspond to the controls 1562 and 1564 on the cordless telephone. The telephone base unit also includes antenna 1574 for providing an RF link to the cordless telephone 1552. The telephone base unit can also contain a display 1572 corresponding to display 1566 on the cordless telephone. The telephone base unit can have a direct wall power connection 1580 and be connected directly to the telephone line via connection 1582. Alternatively, the connection to the telephone network can be via a cellular network. Various designs of the telephone base unit and the cordless telephone are possible. FIG. 13 shows one possible design in which the telephone base unit 1554 has a semicircular tower 1584 that is designed to hold the cordless telephone 1552. The tower 1584 also has the function of providing an elevated tower for holding infrared transmitters and an infrared receiver.

10 FIG. 14 shows the telephone base unit 1584 with the cordless telephone removed. Evident at the base of the tower are contacts 1586 which are used to supply power to charge the battery in the cordless telephone when the cordless telephone is plugged into the telephone base unit. Also shown in FIG. 14 are infrared transmitters 1588. The infrared transmitters can be located around the top of the tower pointing in an upward direction, a right direction, a left direction, a rear direction and a forward direction. The multiple infrared transmitters insure that the telephone base unit will communicate properly with the appliances to be controlled regardless of the orientation of the telephone unit with respect to those units. Also shown in FIG. 14 are infrared receivers 1589 which can be placed at the top of the tower 1584 for receiving information from the appliances.

15 In this application the term appliances includes televisions, cable boxes, satellite receivers, VCRs, stereos and other similar equipment, including any remote controller for the various apparatus. The term appliances also includes other apparatus such as heaters, thermostats, washing machines, ovens, lights, and computers.

20 FIG. 15 shows the cordless telephone 1552 removed from the telephone base unit 1554. In the base of the cordless telephone 1552, batteries 1592 are located. FIG. 15 shows an infrared transmitter 1590 and an infrared receiver 1591 located below the infrared transparent cover 1568. FIG. 16 is a bottom view of the cordless telephone, showing contacts 1596 which engage contacts 1586 on the telephone base unit 1554 when the cordless telephone 1552 is plugged into the telephone base unit 1554.

25 FIG. 17 shows the telephone base unit 1554 located on a table near a video cassette recorder 1602, a cable box 1604 and a television 1600. The cordless telephone 1552, which can be in the same room as the telephone base unit or be in a different room, communicates with the telephone base unit via RF signals 1606. The telephone base unit controls the VCR, cable box, and television set via infrared signals 1601. The cordless telephone, if it is in the

1 same room as the appliances, can also control the appliances via transmission signals 1603, which can be infrared signals, or RF signals if the appliances contain an RF receiver.

As described below, television signals can contain embedded information which can be extracted by the VCR and transmitted to the telephone base unit or to the cordless  
5 telephone via transmission signals 1605, which can be infrared signals, or RF signals if the appliances contain an RF transmitter.

FIG. 18 is a block diagram of the cordless telephone. The cordless telephone has a microcomputer 1610, which consists of a CPU, ROM, RAM, I/O ports, timers and counters, and a clock. The microcomputer is used to implement the decoding of compressed codes  
10 having at least one digit into channel, time-of-day and length commands. Programs stored in the memory of the microcomputer also are instrumental in implementing the other functions of the cordless telephone. The microcomputer has an input from an oscillator 1612 and inputs from the keypad 1616 on the cordless telephone. The microcomputer drives a LCD display 1614 and also drives a warning light-emitting diode 1624. Communications to  
15 the telephone base unit are via transmitter/receiver 1618 and antenna 1570. The cordless telephone can send commands to appliances through the infrared transmitter 1620 or the RF transmitter 1618 and can receive information from the appliances via infrared receiver 1622 or the RF receiver 1618. Battery 1592 provides power to the cordless telephone and can be charged from the telephone base unit.

FIG. 19 shows a block diagram of the telephone base unit 1554. The telephone base unit has a microcomputer 1630 which contains a CPU, ROM, RAM, I/O ports, timers and counters, and a clock. The microcomputer is used to implement the decoding of compressed codes having at least one digit into channel, time-of-day and length commands. Programs  
20 stored in the memory of the microcomputer also are instrumental in implementing the other functions of the telephone base unit. The microcomputer has input from an oscillator 1632 and from a keypad 1636 on the face of the telephone base unit. The microcomputer drives a LCD display 1634 on the telephone base unit and also drives a warning light-emitting diode 1644. Communication with the cordless telephone is via transmitter/receiver 1638 and  
25 antenna 1574. The telephone base unit can send commands to the appliances via five-way infrared transmitter 1640, which can transmit to the front, the back, left, right and up to insure communication with the appliances, or via RF transmitter 1638. Information from the appliances can be received by the telephone base unit via infrared receiver 1642 or via RF receiver 1638. The telephone base unit contains a converter 1643 for providing power from wall power to the telephone base unit and for charging the cordless telephone battery. The  
30 telephone base unit has a direct connection with telephone line 1646 via telephone circuit 1648 which communicates to a decoder 1650, which can be a DTMF decoder, for input to the microcomputer 1630. As discussed above, instead of connection to a telephone line the telephone base unit could be connected to the telephone network via a cellular network. The  
35

1 microcomputer 1630 can communicate to the telephone circuit 1648 either directly or via  
voice generator 1652. The voice generator can synthesize speech for requesting a user to  
enter certain numbers, such as a password or a telephone number.

5 FIG. 20 is a block diagram of a system for controlling appliances via a telephone set.  
As shown in FIG. 20, the telephone base unit 1554 has an infrared (IR) transmitter 1640 and  
an antenna 1574. The cordless telephone 1552 has a RF antenna 1570 and an IR transmitter  
1620. In FIG. 20, a cable box 1604 has an IR receiver 1676 and a satellite receiver 1670  
has an infrared receiver 1678. The VCR 1602, which can receive signal inputs from the  
10 cable box, the satellite receiver, and/or an antenna, has an infrared receiver 1680. The TV  
1600 has an infrared receiver 1682.

The telephone base unit and cordless telephone perform all of the functions of the  
instant programmer of U.S. Patent 5,335,079. The compressed code decoding is performed  
by the microcomputers in either the telephone base unit or the cordless telephone and, at the  
appropriate time, record-on commands are sent to the VCR 1602, and channel-select  
15 commands are sent to the cable box 1604, the satellite receiver 1670, and/or the VCR 1602.  
Then, when recording is complete according to the decoded length from the CDTL  
information for a program to be recorded, the VCR 1602 is commanded to stop recording.  
The warning light-emitting diode 1624 in the cordless telephone and the warning light-  
emitting diode 1644 in the telephone base unit have the same function as the warning light  
20 of the instant programmer.

The operation of the telephone base unit and the cordless telephone in controlling the  
recording of programs is the same as described for the instant programmer described in U.S.  
Patent 5,335,079.

25 Commands can also be sent to a television set based on decoded CDTL information,  
to turn on a television and switch to the correct channel at the appropriate time for a  
program, and then turn off the television when the program is over. This is especially useful  
for handicapped people.

FIG. 21 is a flow diagram of a method for downloading initial setup data to the  
telephone base unit via the telephone network. This method makes the initial setup of the  
30 instant programmer much easier. In step 1690, the user calls a representative at a remote  
site. Then in step 1692, the user identifies his zip code, the cable carrier, the television  
guide used by the user, and the model and brand of the VCR, cable box and any other  
appliances to be controlled, such as a satellite receiver. In step 1694, the representative  
enters this data into a computer, and then in step 1696, the computer downloads initial setup  
35 data to the telephone base unit. Then in step 1698, the telephone base unit via the RF  
antenna sends initial setup data to the cordless telephone. In step 1700, the telephone base  
unit sends the initial setup data to the VCR and any other appliance that requires initial setup  
data. The data sent to the VCR and other appliances depends on the data needed by the VCR

1 or the other appliances to operate with the telephone base unit. Then in step 1702, it is  
verified whether or not the data has been correctly received by the cordless phone and any  
other appliance. If not, then the data is sent again. If the data has been correctly received,  
then the initial setup of the telephone set and the cordless telephone and any appliance is  
5 complete, as shown in step 1704.

Another service that can be performed by a representative at a remote site is to  
generate a set of compressed codes corresponding to selection criteria specified by a user.  
FIG. 22 shows a flow diagram for performing this function. In step 1710, the user calls a  
representative at a remote site, and then in step 1712, the user identifies the TV program  
10 category, such as sports, children's programs or other selection criteria. In step 1714, the  
representative enters the selection criteria into a computer. The computer selects programs  
according to the selection criteria, and then in step 1716, it is determined whether there are  
conflicts between the selected programs. If there are, then the representative inquires from  
the user how the conflicts should be resolved in step 1718. In step 1720, the representative  
15 enters the conflict resolution into the computer, and then in step 1722, the computer adjusts  
the selected programs. In step 1724, the computer generates the compressed codes for the  
selected programs, and then in step 1726, the computer downloads compressed codes for the  
selected programs to the telephone base unit via the telephone network. Then in step 1728,  
the telephone base unit controls the recording of selected programs according to the  
20 downloaded data.

Another embodiment includes apparatus and a method for the user to call from a  
remote telephone to enter a compressed code into the telephone base unit via the telephone  
network. FIG. 23 is a flow diagram of the steps that the telephone base unit performs to  
allow a user to remotely enter a compressed code into the telephone base unit. In step 1730,  
25 the telephone is ringing. In step 1732, it is determined whether the phone has been answered  
by a person. If yes, then in step 1734, the method waits for the telephone to be put back on  
the hook and then the method recycles to step 1730. If the phone is not answered after N  
rings, the telephone base unit answers the telephone call. Then in step 1738, the telephone  
base unit asks the caller (via voice generation) to enter the telephone number that the user  
30 is calling from. If the caller enters a telephone number in step 1740, then in step 1742, the  
telephone number is stored for later review. On the other hand, if the caller enters a  
password in step 1744 and the password is correct as determined by steps 1746, 1748 and  
1750, then in step 1754, the caller is asked to enter a compressed code. The purpose of  
storing telephone numbers that are entered by callers and requiring that a caller enter a  
35 password before being able to enter a compressed code is to provide security so that only an  
authorized caller can enter a compressed code into the telephone base unit. The stored  
telephone number can be used by the user to know who called. In step 1758, the telephone

1 base unit stores the compressed code that has been entered, and then in step 1760, the telephone base unit uses the compressed code to control recording of selected programs.

Another embodiment of the invention is to provide a method and apparatus for the telephone base unit to control the volume of audio apparatus, such as a television set, a video  
5 cassette recorder, a stereo set, etc. The telephone base unit can perform this function via the infrared transmitter or the RF transmitter built into the telephone base unit. FIG. 24 is a flow diagram of a method for performing this function. When the telephone rings in step 1770 and a user answers the telephone in step 1772, then the telephone base unit sends a command to the audio apparatus to lower the volume or entirely mute the audio as shown in  
10 step 1774. These commands are sent via the infrared or RF transmitter in the telephone base unit. When the telephone base unit determines that a call has been terminated in step 1776, then the telephone base unit sends a command to the audio apparatus to raise the volume to the previous level.

In another embodiment of the invention, information is embedded in the television  
15 signal received via cable, satellite receiver, or an antenna, and can be extracted from the television signal by an appliance, such as a VCR and transmitted to the telephone base unit. One method of embedding the information into the television signal is to embed the information in the vertical blanking intervals of a television signal.

FIG. 25 is a diagram illustrating the fields, frames and vertical blanking interval of  
20 an interlaced television scanning raster 1780. The first field 1782 of the television signal starts at the upper left corner of the screen and writes lines 21, 22, . . . 263. At the bottom of the screen, the beam writing the screen retraces in a series of lines back to the top of the screen. These lines are known as the vertical blanking interval lines 1786. During the retrace, the writing to the screen is blanked; however, because the signal is still present,  
25 additional information can be sent during the vertical blanking interval. There are at least 20 lines in a vertical blanking interval. After the vertical blanking interval, the second field 1784 is written on the screen in lines 283, 284, . . . 525 which are interleaved between the lines of the first field 1782. The two fields and the vertical blanking interval together constitute a frame.

30 FIG. 26 is a diagram illustrating the timing 1790 of the vertical blanking interval lines 1-21. As shown, each vertical blanking interval line 1792 occupies a portion of the time span. The vertical blanking interval can contain closed caption data 1791 for the hearing impaired and extended data services (EDS) data 1793.

35 Caption data decoding is further described in the following specifications, which are hereby incorporated by reference herein: Title 47, Code of Federal Regulations, Part 15 as amended by GEN. Docket No. 91-1; FCC 91-119; "CLOSED CAPTION DECODER REQUIREMENTS FOR THE TELEVISION RECEIVERS"; Title 47 C.F.R., Part 73.682(a)(22), Caption Transmission format; Title 47, C.F.R. Part 73.699, figure 6;



1 "TELEVISION SYNCHRONIZING WAVE FORM"; Title 47, C.F.R., Part 73.699, figure 17a; "LINE 21, FIELD 1 DATA SIGNAL FORMAT"; and PBS Engineering Report No. E-7709-C, "TELEVISION CAPTIONING FOR THE DEAF: SIGNAL AND DISPLAY SPECIFICATIONS."

5 The extended data services (EDS) is further described in the Recommended Practice for Line 21 Data Service, Electronics Industries Association, EIA-608 (drafts October 12, 1992 and June 17, 1993), the subject matter of which is incorporated herein by reference.

The vertical blanking interval can also contain, as illustrated by data 1794, a channel-specific program guide (CSPG), program-related information (PRI), instant information (IINFO), a video magazine (V(M)) packet, a TPA (tape identification, program number, absolute address) packet, and/or a directory of programs recorded on a tape. Each vertical  
10 blanking interval line can contain 2 to 4 bytes of information. So, to transfer an entire set of data, such as a directory, multiple fields and frames are required.

FIG. 27 shows a VCR 1800 capable of decoding information in the vertical blanking  
15 interval lines and transmitting that information to the base telephone unit. The VCR 1800 shown in FIG. 27 is very similar to the indexing VCR described in patent application Serial No. 08/176,852, filed December 30, 1993, which is incorporated herein by this reference as though set forth in full. As shown in FIG. 27, the VCR 1800 has a tuner 1802 which receives a television signal from either an antenna, a cable box 1604, or a satellite receiver  
20 1670. A VBI decoder 1804 is coupled to the output of tuner 1802. A microcomputer 1810, which implements the VCR control logic, receives the output of VBI decoder 1804. The microcomputer 1810 can control character generator 1806 to provide an on-screen display of information decoder by VBI decoder 1804 on a television monitor by adding the character to the television signal in adder 1808. The VCR can also transmit the information decoded  
25 by the VBI decoder 1804 via the infrared transmitter 1814 to the telephone base unit. The transmitter 1814 can also be implemented as an RF transmitter. The VCR 1800 has memory for storing a directory of programs recorded on video cassette tape and is designed to allow a user to conveniently access a particular program recorded on a tape. This is done by using the TPA packets and a directory recorded on a tape as shown in FIG. 28.

30 FIG. 28 shows a portion of a tape 1820 onto which TPA packets have been written in VBI line 19, represented as element 1822, and in which the directory has been written into VBI line 20 of the tape, represented as element 1824. The TPA packets 1828 each contain a tape identification, a program number and an absolute address along the tape. The directory 1826, which is recorded along the tape, contains a directory of all of the programs  
35 on the tape. The user accesses a program by selecting one from the directory and then the indexing VCR 1800 can automatically access the beginning of the program by using the TPA packets recorded along the tape.

1        FIG. 29A shows a diagram of the format of a TPA packet recorded in the vertical  
blanking interval lines. The TPA packet contains a tape identification 1830, a program  
number 1832, and an absolute address 1834. FIG. 29B shows the information that can be  
5        contained in a directory in the VBI lines. The directory can contain a program title 1836,  
a program number 1838, a start address along the tape for the program 1840, and an address  
1842, a record speed 1844, and additional fields 1846 which can contain, for example, a  
short description of the program. The method for using TPA packets and a directory for  
allowing a user to conveniently access a program along a tape is further described in patent  
10       application Serial No. 08/167,185, filed December 15, 1993, which is incorporated herein  
by this reference as though set forth in full.

      In the embodiment shown in FIG. 27 for an indexing VCR 1800, any information in  
a television signal that is recorded in the vertical blanking interval lines can be sent to the  
telephone base unit via infrared transmitter 1814. For example, if a tape is being played on  
15       the VCR 1800 that has TPA packets and a directory stored along the tape, then information  
in the TPA packets or the directory can be sent via infrared transmitter 1814 to the telephone  
base unit and viewed on the display of the telephone base unit or on the display of the  
cordless telephone, which can receive the same information via an infrared receiver on the  
cordless telephone or from the telephone base unit via the RF communication link between  
20       the telephone base unit and the cordless telephone. As described above, the information  
could also be sent from the VCR via an RF transmitter.

      In an embodiment of the invention, program-related information that is embedded in  
the vertical blanking interval lines of a television signal includes a telephone number related  
to information that is being broadcast, or that has been recorded on a tape that is being  
played on the VCR, such as an advertisement. The telephone number in the program-related  
25       information can be extracted from the television signal via VBI decoder 1804 and sent to the  
telephone base unit via infrared transmitter 1814. A method is provided for automatically  
dialing this number upon command of the user, as shown in FIG. 32. In step 1870 of FIG.  
32, the program-related information is displayed on the television monitor by using character  
generator 1806. The program-related information is transmitted to the telephone base unit  
30       and/or the cordless telephone via the infrared transmitter 1814 and stored in the telephone  
base unit. Then in step 1874, the user can operate the cordless telephone or the telephone  
base unit to recall the program-related information containing the telephone number from  
storage in the telephone base unit and transmit the data for display on either the television  
monitor or on the display of the telephone base unit or the cordless telephone. The RF  
35       communication link between the cordless telephone and the telephone base unit makes the  
location of the storage of the program-related information in either the telephone base unit  
or the cordless telephone transparent to the user. Then in step 1876, if the displayed  
program-related information is a telephone number, then the user can push a button on the

1 cordless telephone or the telephone base unit to automatically dial the program-related information telephone number.

5 In an alternate embodiment, the program related information contains a telephone number and when sent to the telephone base unit, a little green light on the telephone base unit blinks, indicating the telephone has a telephone number, which can be dialed by pressing a single button. Via the communication link with the cordless telephone, a light on the cordless telephone also blinks and the user can press a single button on the cordless telephone to dial the telephone number.

10 FIG. 30 is a block diagram of a system using a telephone base unit 1554, a cordless telephone 1552, indexing VCR 1800, cable box 1604, satellite receiver 1670, and television 1600. In addition to the functions of the system of FIG. 20, the system of FIG. 30 includes a capability of the VCR 1800 decoding information embedded in the television signal in the vertical blanking interval lines via VBI decoder 1804 and transmitting that information to the telephone base unit 1554 or the cordless telephone 1552 via infrared transmitter 1814.

15 In another embodiment of the invention, the telephone base unit 1555 contains all the functions of the telephone base unit 1554 and in addition has a VBI decoder 1860, a character generator 1862, and a television signal adder 1864, as shown in FIG. 31. In the system shown in FIG. 31, the output of a conventional VCR 1602 is sent to the telephone base unit 1555, which can decode information embedded in a television signal with VBI decoder 1860, generate characters in character generator 1862, add the generated characters to the television signal in adder 1864, and send the composite television signal to television 1600 which can display the television signal on television monitor 1850. The key advantage of telephone base unit 1555 is that information can be decoded from the vertical blanking interval lines and stored and used by the telephone base unit 1555 without the need for an indexing VCR 1800, as shown in the system of FIG. 30. Thus, the increased cost of an indexing VCR 1800 is avoided for households that already own a more conventional VCR 1602.

25 The described embodiments of the invention are only considered to be preferred and illustrative of the inventive concept, the scope of the invention is not to be restricted to such embodiments. Various and numerous other arrangements may be devised by one skilled in the art without departing from the spirit and scope of this invention.

30 It is therefore intended by the appended claims to cover any and all such applications, modifications and embodiments within the scope of the present invention.

1 **WHAT IS CLAIMED IS:**

1. An apparatus for using compressed codes for controlling at least one appliance comprising:

5 telephone set means for telephonic communication;

the telephone set means comprising:

a) means for entering compressed codes each having at least one digit and each representative of, and compressed in length from, a combination of channel, time-of-day and length commands for a program;

10 b) means for decoding the compressed codes having at least one digit into channel, time-of-day and length commands;

c) a clock for providing an output as a function of time coupled to the means for decoding; and

15 d) means for transmitting commands to the appliance.

2. The apparatus of claim 1 wherein said telephone set means further comprises means for commanding a selection of a channel on an appliance in response to the decoded channel commands and in response to a comparison of the decoded time-of-day commands with the clock output.

20

3. The apparatus of claim 2 wherein said telephone set means further comprises: means for turning a recorder on in response to a comparison of the decoded time-of-day commands with the clock output; and

25 means for turning the recorder off in response to comparison of the record on time with the decoded length commands.

4. The apparatus of claim 1 wherein the means for decoding a compressed code into channel, time-of-day and length commands performs the decoding as a function of the clock output.

30

5. The apparatus of claim 1 wherein the telephone set means comprises a cordless telephone.

35 6. The apparatus of claim 5 wherein the telephone set means comprises a telephone base unit and wherein the telephone base unit comprises a first radio frequency transmitter and a first radio frequency receiver means for communication to the cordless telephone.

1           7.     The apparatus of claim 6 wherein the cordless telephone comprises a second radio frequency transmitter and a second radio frequency receiver means for communication to the telephone base unit.

5           8.     The apparatus of claim 1 wherein the means for transmitting commands comprises first infrared transmitter means for sending commands.

          9.     The apparatus of claim 1 wherein the means for transmitting commands comprises first radio frequency transmitter means for sending commands.

10          10.    The apparatus of claim 7 wherein the cordless telephone comprises second infrared transmitter means for transmitting commands to the appliance.

15          11.    The apparatus of claim 7 wherein the cordless telephone second radio frequency transmitter means is used for sending commands to the appliance.

          12.    The apparatus of claim 3 wherein the recorder comprises a first receiver means for receiving commands.

20          13.    The apparatus of claim 1 wherein an appliance comprises:  
                  means for decoding information embedded in the program; and  
                  third transmitter means for sending the decoded information to the telephone set means.

25          14.    The apparatus of claim 13 wherein the telephone set means further comprises a second receiver means for receiving information from the appliance.

          15.    The apparatus of claim 14 further comprising a cordless telephone comprising a third receiver means for receiving information from the appliance.

30          16.    The apparatus of claim 15 wherein the first, second and third receiver means each comprise an infrared receiver and wherein the third transmitter transmitter means comprises an infrared transmitter.

35          17.    The apparatus of claim 15 wherein the first, second and third receiver means comprise a radio frequency receiver and wherein the third transmitter transmitter means comprises a radio frequency transmitter.

1           18. The apparatus of claim 5 wherein the cordless telephone comprises batteries for supplying power to the cordless telephone means and means for coupling the cordless telephone means to the telephone set means for charging the batteries.

5           19. The apparatus of claim 1 wherein the means for entering a compressed code comprises a plurality of keys.

          20. The apparatus of claim 5 wherein the cordless telephone comprises a plurality of keys for entering a compressed code.

10           21. The apparatus of claim 1 further comprising:  
          a stack memory coupled to the means for decoding a compressed code for storing a plurality of channel, time-of-day and length commands; and  
          wherein the means for decoding a compressed code further comprises a means  
15 for periodically comparing the time-of-day commands in the stack memory and transmitting the channel, time-of-day and length commands to the appliance when the time-of-day commands have a predetermined relation with the clock output.

20           22. The apparatus of claim 1 wherein the telephone set means further comprises means for warning a user that the clock output will compare within a preset time to the time-of-day commands.

25           23. The apparatus of claim 5 wherein the cordless telephone further comprises means for warning a user that the clock output will compare within a preset time to the time-of-day commands.

          24. The apparatus of claim 14 wherein the means for decoding information embedded in the program comprises:

30           a vertical blanking interval line decoder means for extracting information embedded in vertical blanking interval lines of a television signal.

          25. The apparatus of claim 24 wherein the telephone set means comprises a means for storing the information received via the second receiver from the appliance.

1           26.   The apparatus of claim 25 further comprising:  
              means for displaying the information received from the appliance;  
              means to command the telephone set means to dial a telephone number  
5           contained in the information; and  
              means for dialing the telephone number upon a command.

          27.   The apparatus of claim 15 wherein the cordless telephone further comprises:  
              means for storing information received via the third receiver from the appliance.  
              means for displaying the information received from the appliance;  
10           means for commanding the cordless telephone means to dial a telephone number  
          contained in the information; and  
              means for dialing the telephone number upon a command.

          28.   The apparatus of claim 1 further comprising:  
15           means for answering a telephone call from a second telephone after a  
          predetermined set of rings;  
              means for confirming that a caller is authorized to enter a compressed code; and  
              means for allowing the caller to enter a compressed code for a selected  
20           program.

          29.   The apparatus of claim 28 wherein the means for confirming that a caller is  
authorized to enter a compressed code comprises a voice generation means for speaking  
commands to the caller.

25           30.   The apparatus of claim 1 further comprising:  
              means for determining that a call to the telephone set has been answered; and  
              means for commanding the appliance to set an audio volume lower upon  
determining that a call has been answered.

30           31.   The apparatus of claim 30 further comprising:  
              means for determining that a call that has been answered, has subsequently been  
terminated; and  
              means for commanding the appliance to set the audio volume higher upon  
determining that a call has been terminated.

35           32.   A method for using compressed codes for program recording comprising the  
steps of:  
              a caller initiating a telephone call to a telephone set;

1           the telephone set answering the call after a predetermined number of rings;  
the telephone set confirming that the caller is authorized to enter a compressed  
code;

5           the caller entering compressed codes each having at least one digit and each  
representative of, and compressed in length from, the combination of channel, date, time-of-  
day and length commands for a program; and  
the telephone set storing the entered compressed codes.

10           33. The method of claim 32 comprising the steps of:  
the telephone set decoding each compressed code to obtain channel, date, time-  
of-day and length commands;  
the telephone set comparing the date and time-of-day commands to the output  
of a clock for a predetermined relation;  
15           the telephone set transmitting channel select and record on commands to a  
recorder after the predetermined relationship is found to exist; and  
the telephone set transmitting record off commands to the recorder when a  
measured length of time compares with the length command.

20           34. The method of claim 32 wherein the step of confirming that the caller is  
authorized to enter a compressed code comprises the steps of:  
requesting the caller to enter a telephone number;  
if the number entered is a telephone number then storing the telephone number  
for later use;  
25           if the number entered is a password, then confirming that the password is  
correct; and  
if the number is correct, then asking the user to enter a compressed code.

30           35. A method of storing data in a telephone set comprising the steps of:  
initiating a telephone connection with a remote site;  
communicating background information to the remote site;  
converting the background information into data for downloading;  
transferring the data for downloading over the telephone connection to the  
telephone set; and  
35           storing the data for downloading in the telephone set.



1           36.    The method of claim 35 comprising the steps of:  
              transmitting the data for downloading from the telephone set to the appliance;  
and  
              storing the data for downloading in the appliance.

5           37.    The method of claim 35 comprising the steps of:  
              transmitting the data for downloading from the telephone set to a cordless  
telephone; and  
              storing the data for downloading in the cordless telephone.

10           38.    The method of claim 36 or 37 further comprising, after the step of transmitting  
the download data, the steps of:  
              determining if the step of transmitting was performed without error; and  
              retransmitting the download data from the telephone set if an error occurred in  
15 the step of transmitting.

          39.    A system for using compressed codes for programs identified by user selection  
criteria comprising:

20               a first telephone on a telephone network programmable from a second telephone  
on the telephone network, the first telephone controlling the recording of the identified  
programs on a video recorder; and

              a source of information to provide the compressed codes for programs identified  
by user selection criteria coupled to the second telephone, the source including a computer  
for supplying, in response to the user selection criteria, compressed codes for the selected  
25 programs to the second telephone.

          40.    A method of using compressed codes for television program scheduling  
comprising the steps of:

30               transmitting selection criteria for television programs over a telephone network  
to a remote location;

              entering the selection criteria at the remote location into a source of compressed  
codes for the programs identified by the selection criteria;

              transmitting the compressed codes from the remote location over the telephone  
network; and

35               downloading the compressed codes from the telephone network into a memory  
of a telephone set for subsequent control of at least one appliance.

1           41. A method of permitting programs to be recorded by a recorder for time shifted viewing comprising:

          providing a cordless telephone having a means for transmitting signals to the recorder and a clock with an output as a function of time;

5           entering into the cordless telephone compressed codes each having at least one digit and each representative of, and compressed in length from, the combination of channel, time-of-day and length commands for a program;

          decoding each compressed code to obtain channel, time-of-day and length commands;

10          providing a memory;

          storing each of the channel, time-of-day and length commands into the memory;

          reordering the channel, time-of-day and length commands in the memory into temporal order;

15          comparing the time-of-day commands of the temporally earliest in time entry in the memory to the output of the clock for a predetermined relation;

          transmitting channel select and record on commands to the recorder after the predetermined relationship is found to exist;

          selecting the channel;

          recording the program;

20          measuring a length of time from transmitting the record on command; and  
          transmitting record off commands to the recorder when the measured length of time compares with the length command.

25          42. The method of claim 41 wherein the steps of selecting and recording are performed by a video cassette recorder.

          43. The method of claim 41 wherein the step of selecting comprises selection by a cable box.

30          44. The method of claim 41 wherein the step of selecting comprises selection by a satellite receiver.

35          45. The method of claim 41 which further comprises the step of advancing the time-of-day command by a predetermined number of hours.

          46. The method of claim 45 which further comprises the step of retarding the time-of-day command by a predetermined number of hours.

1           47. An apparatus for using compressed codes for recording broadcasted programs comprising:

          cordless telephone means for telephonic communication having a means for transmitting signals;

5           means for entering into the cordless telephone means compressed codes each having at least one digit and each representative of, and compressed in length from, the combination of individual channel, date, time-of-day and length commands for a program;

          means for decoding each compressed code into channel, time and length commands coupled to the cordless telephone means;

10          means for storing the channel, date, time-of-day and length commands in the cordless telephone means;

          a clock with an output as a function of time coupled to the cordless telephone means;

15          a means for reordering the channel, date, time-of-day and length commands in the means for storing into date and time-of-day temporal order;

          a means for comparing the date and time-of-day commands of the temporally earliest in time entry in the means for storing to the output of the clock for a predetermined relation;

20          a means coupled to the cordless telephone means for transmitting channel select and record on commands to a recorder after the predetermined relationship is found to exist;

          a means for measuring length of time from transmitting a record on command coupled to the cordless telephone means; and

          a means for transmitting record off commands when the measured length of time of recording compares with the length command.

25           48. The apparatus of claim 47 which further comprises:

          a channel selector responsive to the channel select commands; and

          a means for recording the program responsive to the record on and record off commands.

30           49. The apparatus of claim 47 wherein the channel selector comprises a cable box.

          50. The apparatus of claim 47 which further comprises:

35          means for substituting a local channel number for a channel number in the channel command.

1           51. The apparatus of claim 47 further comprising:  
              means for warning a user that the clock output will compare within a preset  
time to the date and time-of-day commands.

5           52. The apparatus of claim 47 further comprising:  
              means for transmitting simultaneously in forward, backward, left, right and  
upward directions.

10           53. The apparatus of claim 47 further comprising:  
              means for advancing time-of-day commands decoded from a compressed code  
by three hours; and  
              means for retarding time-of-day commands decoded from a compressed code  
by three hours.

15           54. The apparatus of claim 47 further comprising:  
              means for storing a plurality of protocol sets of transmit signals coupled to the  
means for remote control; and  
              means for selecting a protocol set of transmit signals for a particular means for  
recording.

20           55. A method of using compressed codes for program recording comprising the step  
of:  
              providing an advertisement wherein the advertisement has an associated  
compressed code having at least one digit and each representative of, and compressed in  
25           length from, the combination of the individual channel, date, time-of-day and length data for  
a broadcast; and  
              entering the compressed code associated with the advertisement into a telephone  
set.

30           56. The method of claim 55 further comprising the steps of:  
              transforming the compressed code into a binary number;  
              reordering the bits in the binary number to obtain a reordered binary  
compressed code;  
              separating the reordered binary compressed code into channel, time and length  
35           priority indices;  
              providing priority vectors for channel, time and length;  
              using the channel, time and length priority indices to derive channel, time and  
length commands from the priority vectors for channel, time and length;

1 comparing the date and time-of-day commands to the output of a clock for a predetermined relation;

selecting the channel specified in the channel command after the predetermined relation is found to exist;

5 enabling recording by the video cassette recorder of the video signals on the selected channel by commencing recording after the predetermined relation is found to exist; and

utilizing the length command to terminate the recording.

10 57. The method of claim 55 wherein the step of transforming further comprises the steps of:

extracting a validity period code from the compressed code;

using the validity period code to select a scramble method for unscrambling the compressed code to obtain an unscrambled compressed code;

15 converting groups of decimal numbers of the unscrambled compressed code to groups of binary numbers;

concatenating the groups of binary numbers into one binary number; and deleting the validity period code from the one binary number.

20 58. The method of claim 55 further comprising the step of: substituting a local channel number for a channel number in the channel command.

25 59. The method of claim 55 wherein the step of comparing further comprises the step of warning a user that the output of the clock will compare within a preset time to the date and time-of-day commands.

60. A method of using compressed codes for program recording comprising the steps of:

30 providing a cordless telephone having a means for decoding compressed codes each having at least one digit and each representative of, and compressed in length from, the combination of channel, time-of-day and length commands for a program to obtain channel, time-of-day and length commands;

determining that a call to the telephone set has been answered; and

35 transmitting a command to the appliance to lower the volume upon determining that a call has been answered.

1           61.   The method of claim 60 further comprising the steps of:  
              determining that a call to the telephone set that has been answered, has  
              subsequently been terminated; and  
              transmitting a command to the appliance to raise the volume upon determining  
5           that a call has been terminated.

              62.   An appliance remote control and a telephone handset comprising:  
                  a housing;  
                  a plurality of keys on the housing;  
10               a telephone microphone and earphone mounted on the housing for generating  
              and reproducing telephone audio signals, respectively;  
              means responsive to at least one of the keys for generating a telephone control  
              signal;  
              means for communicating the telephone control signal to a telephone base  
15           station and the telephone audio signals from the telephone base station to the telephone  
              handset and from the telephone handset to the telephone base station;  
              means responsive to at least one of the keys for entering a compressed code;  
              means for decoding the compressed codes each having at least one digit and  
20           each representative of, and compressed in length from, the combination of channel, time-of-  
              day and length commands to obtain channel, time-of-day and length commands; and  
              means for transmitting the channel, time-of-day and length commands to control  
              the appliance.

              63.   Apparatus in accordance with claim 62 further comprising:  
25               means responsive to at least one of the keys for generating control signals for  
              at least one appliance; and  
              means for communicating the control signals to the appliance.

              64.   Apparatus in accordance with claim 62 wherein the means for communicating  
30           the telephone control signal to a telephone base station and the telephone audio signals from  
              the telephone base station to the telephone handset and from the telephone handset to the  
              telephone base station comprises a radio frequency communication link.

              65.   Apparatus in accordance with claim 63 wherein  
35           the means for communicating the control signals to the appliance comprises a radio frequency  
              communication link.

1           66. Apparatus in accordance with claim 62 wherein  
the means for communicating the commands to the appliance comprises a radio frequency  
communication link.

5           67. Apparatus in accordance with claim 64 comprising  
a radio frequency communication link to the telephone base unit.

10           68. Apparatus in accordance with claim 62 wherein  
the means for communicating the commands to the appliance further comprises an infrared  
communication link.

15           69. Apparatus in accordance with claim 63 wherein  
the means for communicating the control signals to the appliance further comprises an  
infrared communication link.

20           70. A system for appliance remote control and for a cordless telephone comprising:  
a housing;  
a plurality of keys on the housing;  
a telephone microphone and earphone mounted on the housing for generating  
and reproducing telephone audio signals, respectively;  
means in the housing responsive to at least one of the keys for generating a  
telephone control signal;  
means in the housing for communicating the telephone control signal and the  
telephone audio signals to a telephone base station;  
25           means in the housing responsive to at least one of the keys for entering a  
compressed code representative of, and compressed in length from, the combination of  
channel, time-of-day and length commands;  
means for transmitting the compressed codes via a radio frequency  
communication link to the telephone base station;  
30           means for converting the compressed code from radio frequency to infrared  
signals located in the telephone base unit;  
means for transmitting the infrared signals from the telephone base unit to the  
appliance.

35           71. The system of claim 67 wherein said cordless telephone further comprises:  
means for decoding the compressed codes each having at least one digit and  
each representative of, and compressed in length from, the combination of channel, time-of-  
day and length commands to obtain channel, time-of-day and length commands.

1           72. The system of claim 67 wherein said telephone base unit telephone further comprises:

5                 means for decoding the compressed codes each having at least one digit and each representative of, and compressed in length from, the combination of channel, time-of-day and length commands to obtain channel, time-of-day and length commands.

73. A method for using compressed codes for controlling at least one appliance comprising the steps of:

10                 providing a telephone set means for telephonic communication having a means for decoding compressed codes each having at least one digit and each representative of, and compressed in length from, the combination of channel, time-of-day and length commands to obtain channel, time-of-day and length commands;

15                 decoding information embedded in a program received by an appliance, the decoding information step performed by the appliance; and

                  sending the decoded information from the appliance to the telephone set means.

20           74. The method of claim 70 wherein the step of decoding information embedded in the program comprises the step of decoding information embedded in a vertical blanking interval line of a television signal.

75. The method of claim 70 further comprising the steps of:  
displaying the decoded information received from the appliance; and  
dialing a telephone number contained in the decoded information.

25           76. A telephone apparatus comprising:  
a first television signal input;  
means for decoding information embedded in the first television signal;  
means for inserting the decoded information into a second television signal; and  
means for displaying the decoded information.

30           77. The telephone apparatus of claim 73 wherein the means for decoding information embedded in the first television signal comprises:

35                 a vertical blanking interval line decoder means for decoding information embedded in vertical blanking interval lines of the first television signal.

78. The telephone apparatus of claim 74 wherein the means for displaying the decoded information comprises a television.



1           79. The telephone apparatus of claim 74 further comprising:  
              means integral to the telephone set means for decoding compressed codes each  
              having at least one digit and each representative of, and compressed in length from, the  
              combination of channel, time-of-day and length commands to obtain channel, time-of-day and  
5           length commands.

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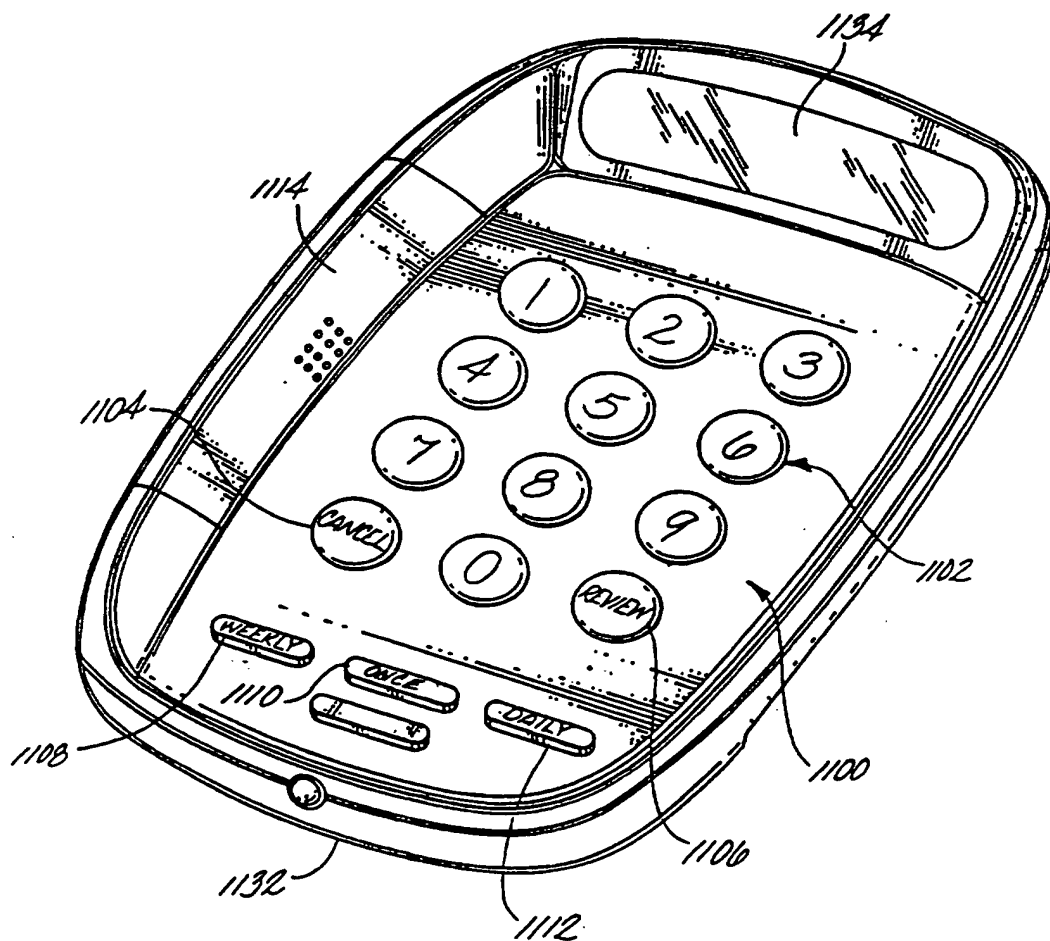
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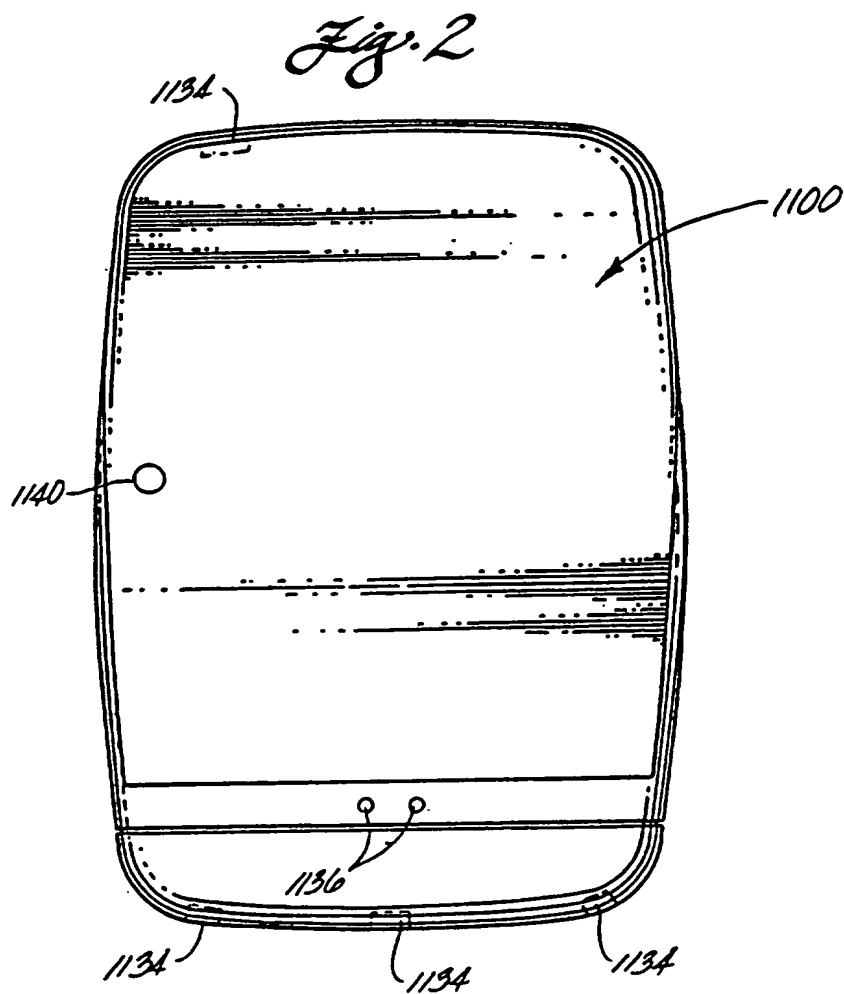
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*Fig. 1*





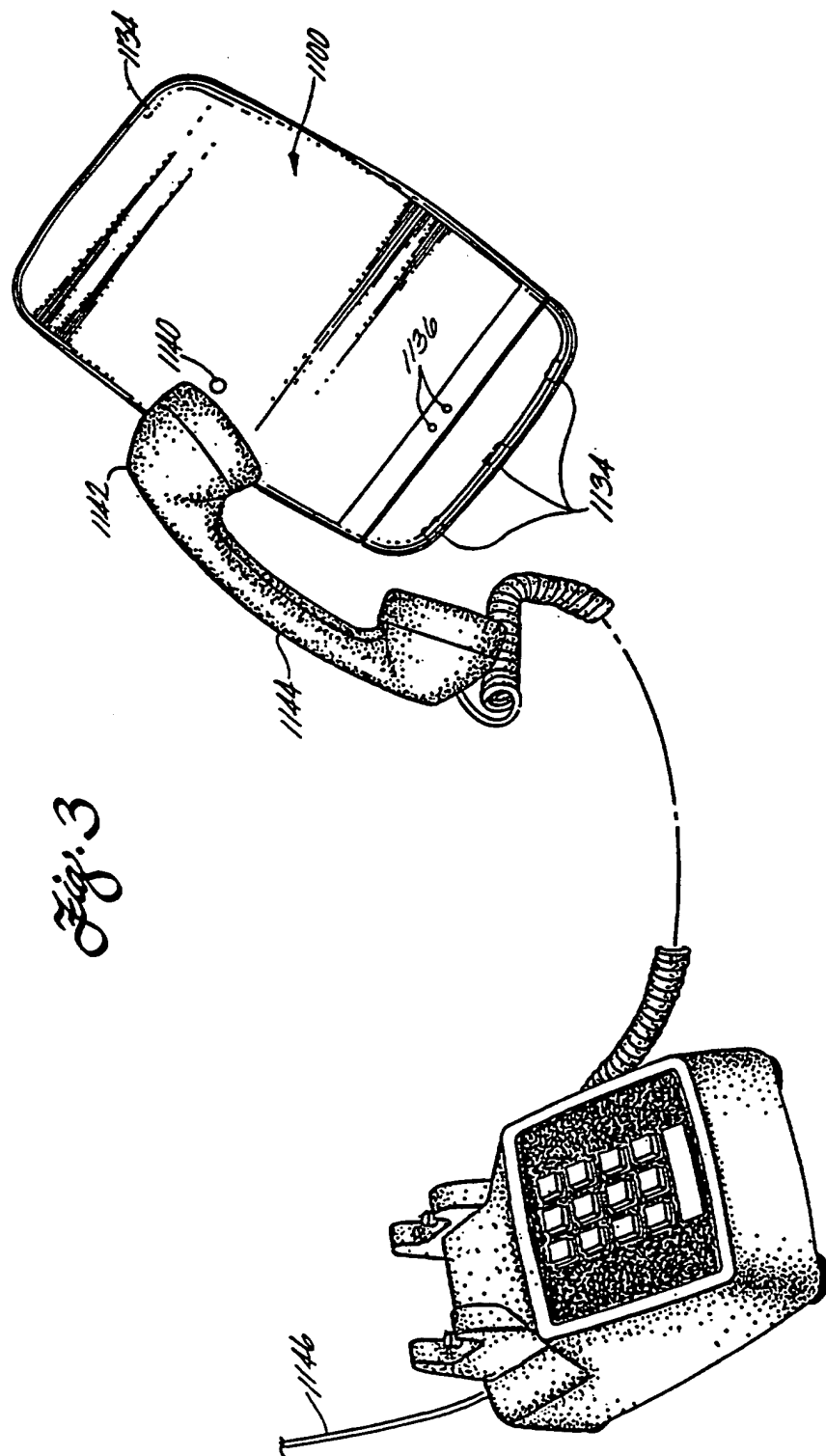


Fig. 3

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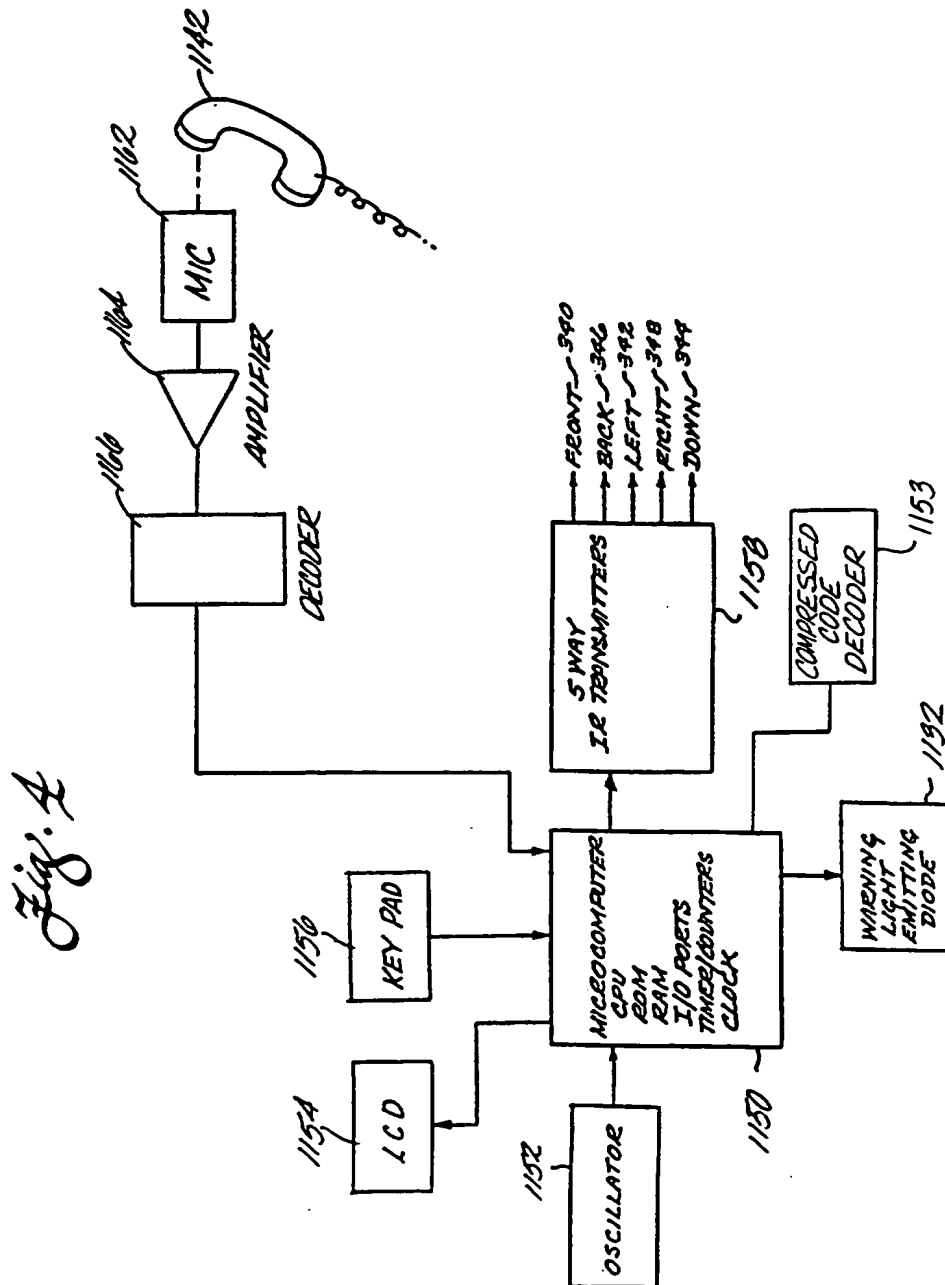
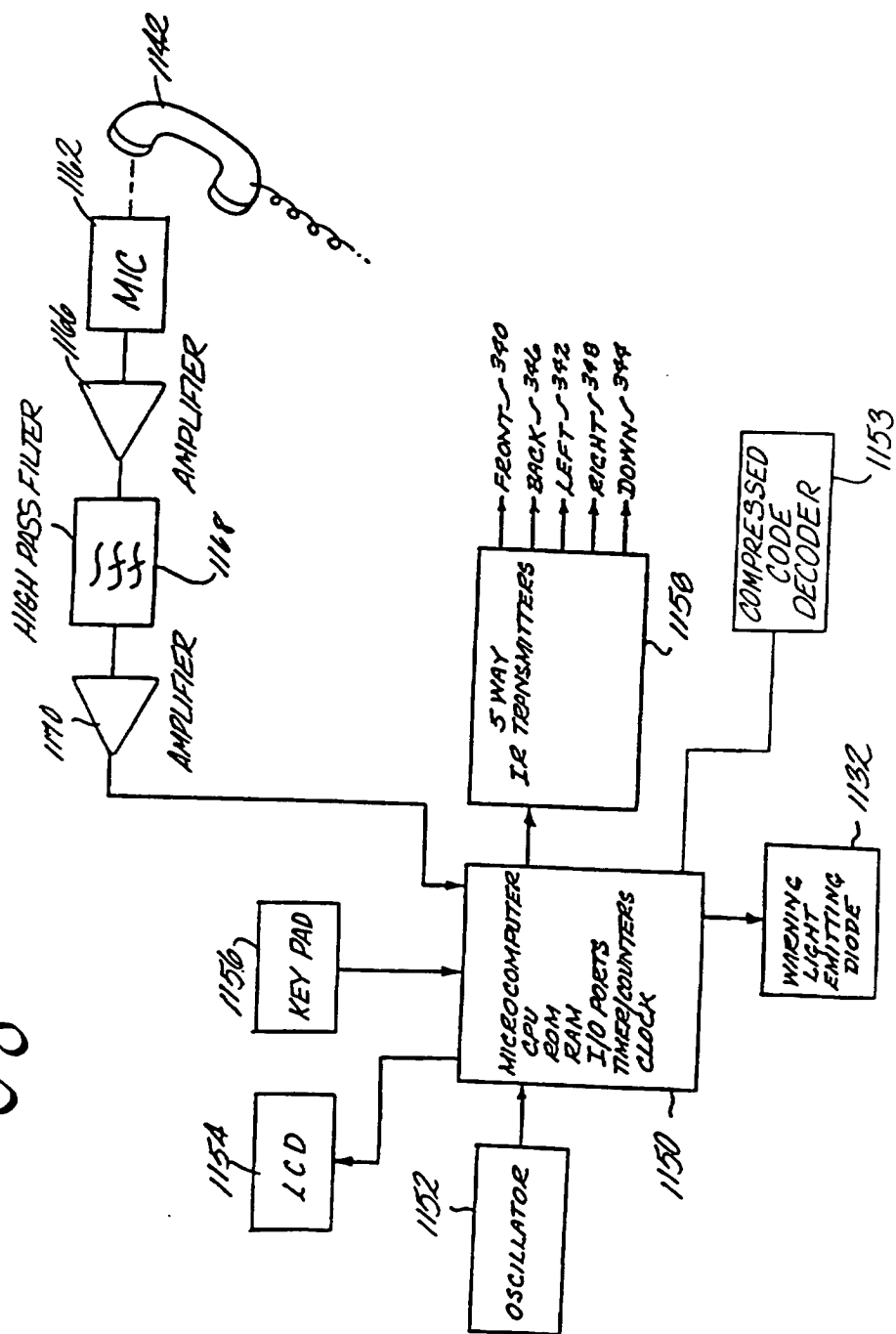
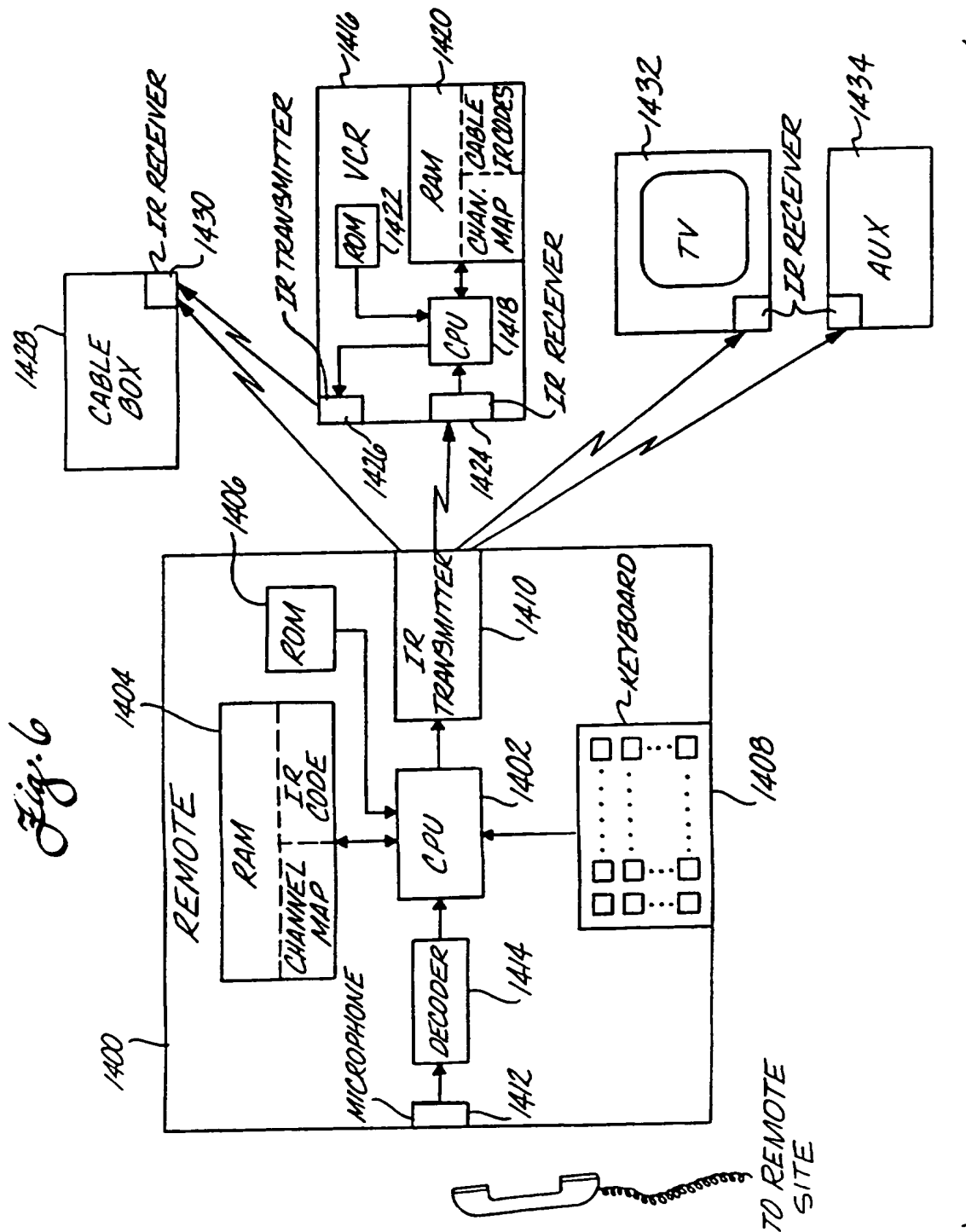


Fig. 5

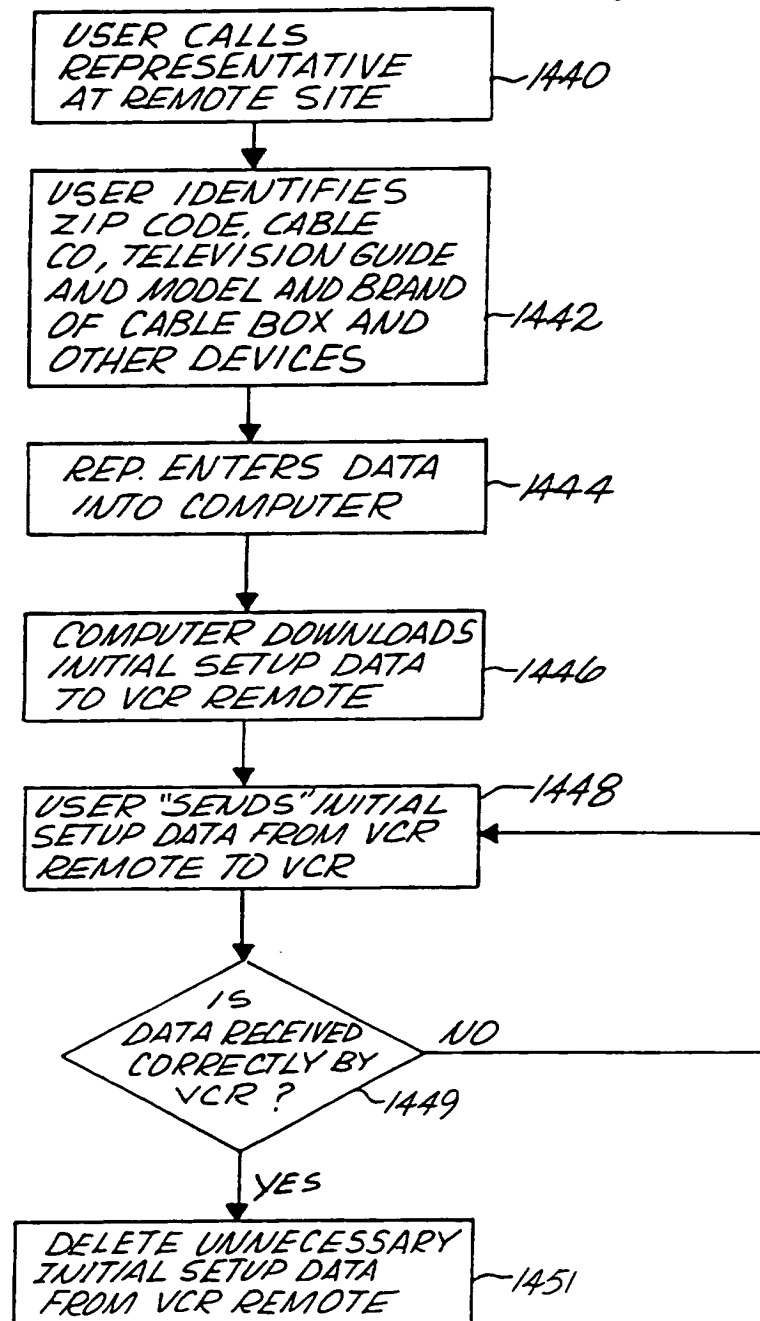


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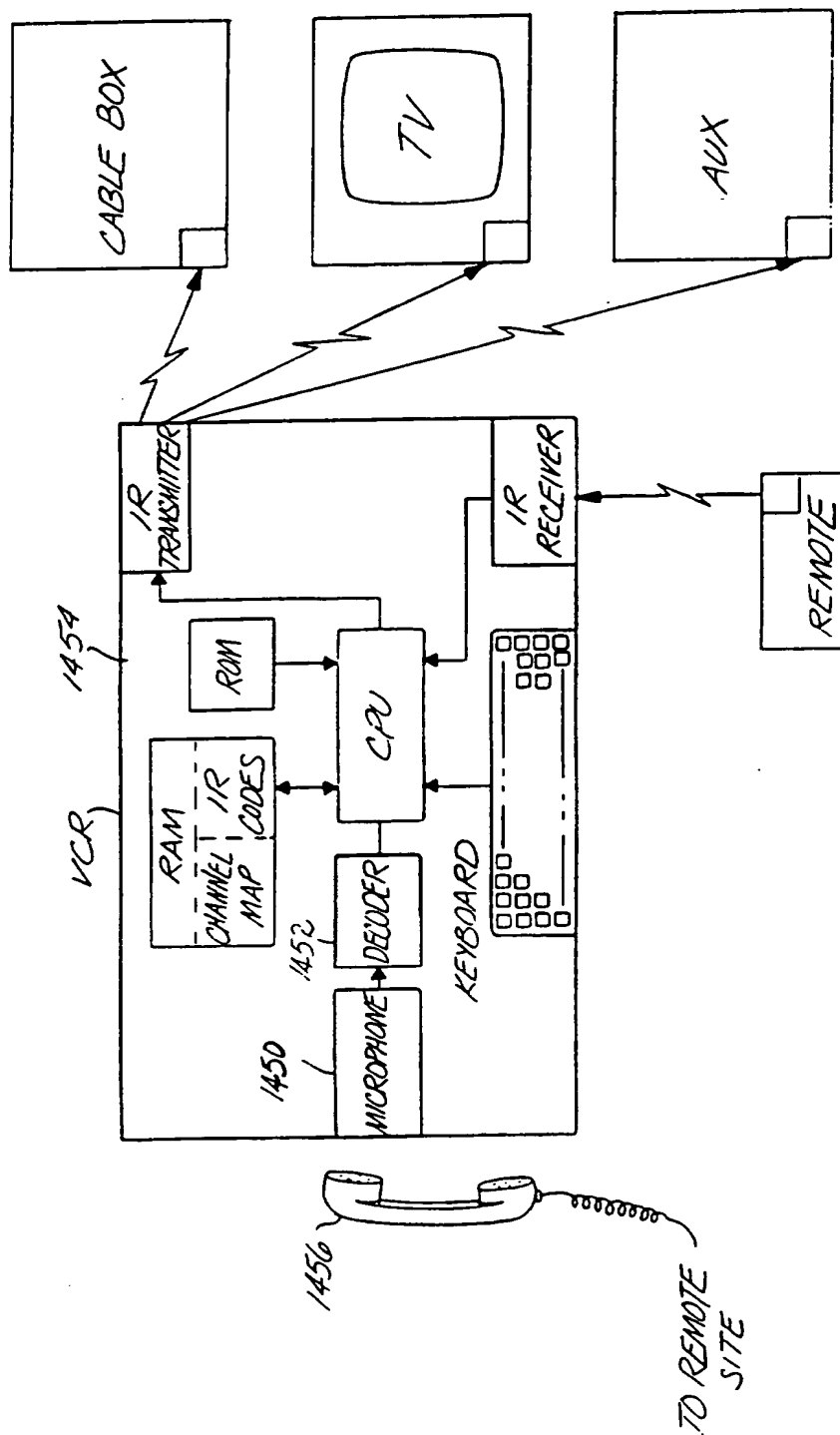
Fig. 7



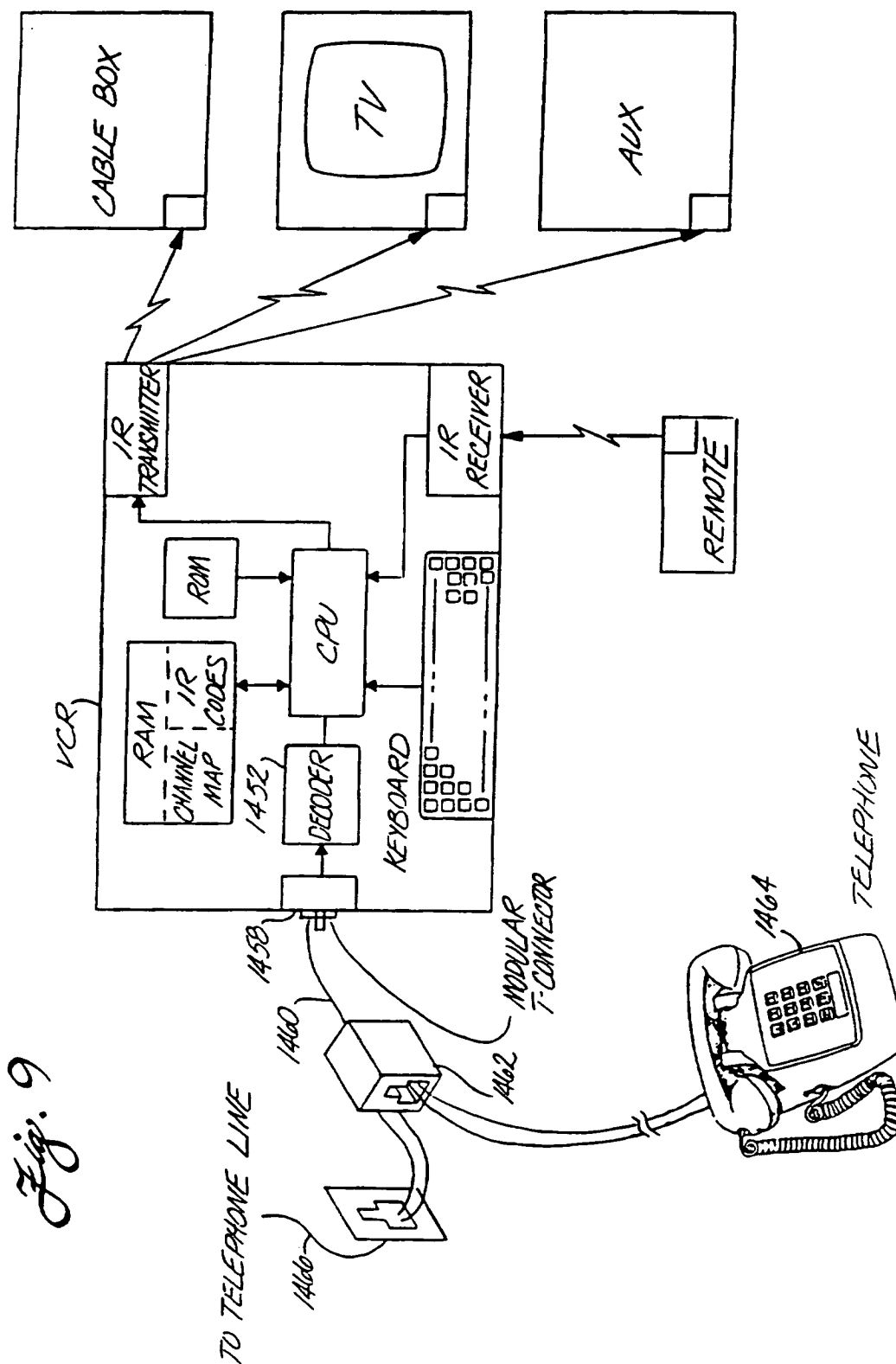


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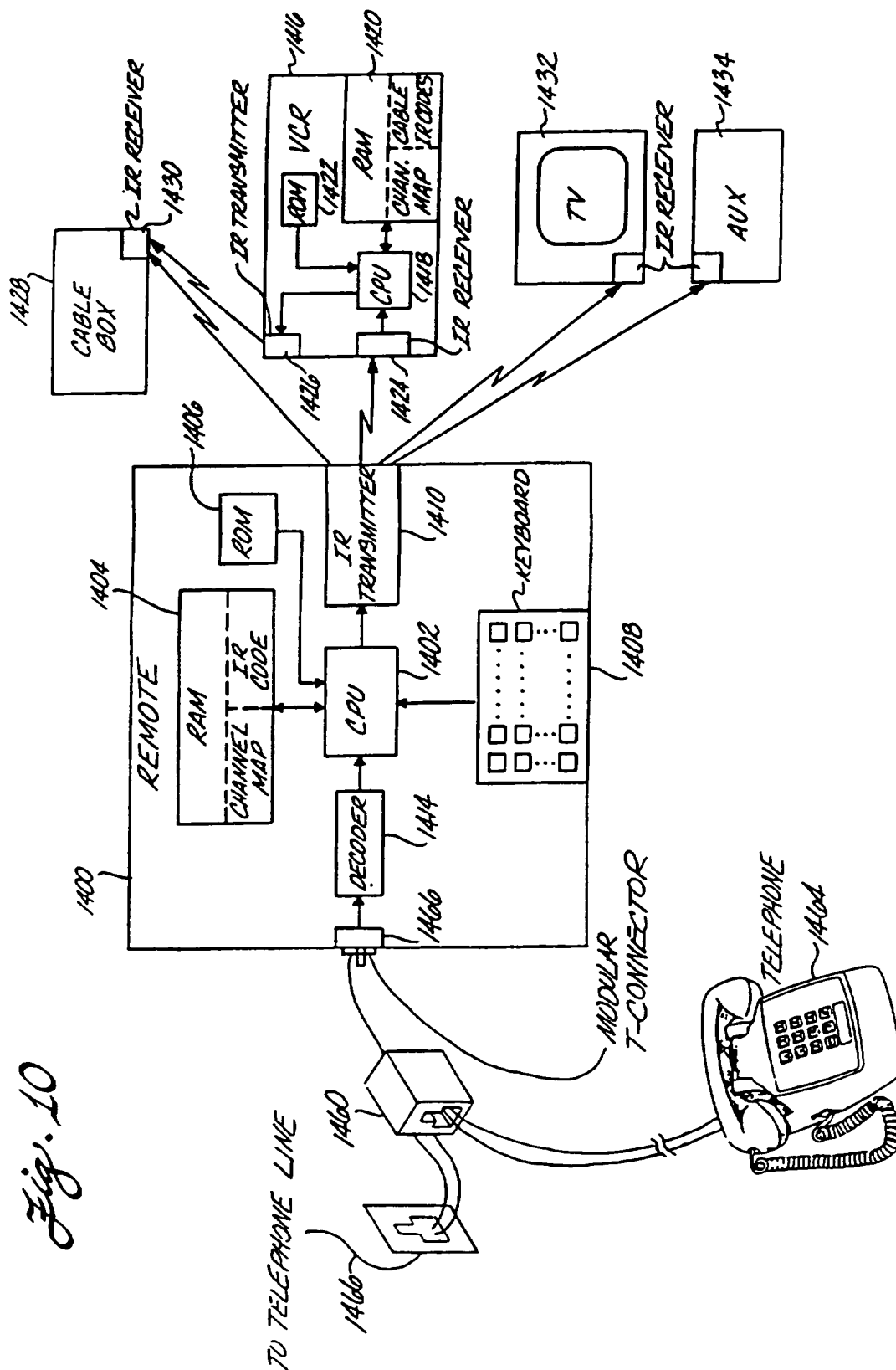
Fig. 8



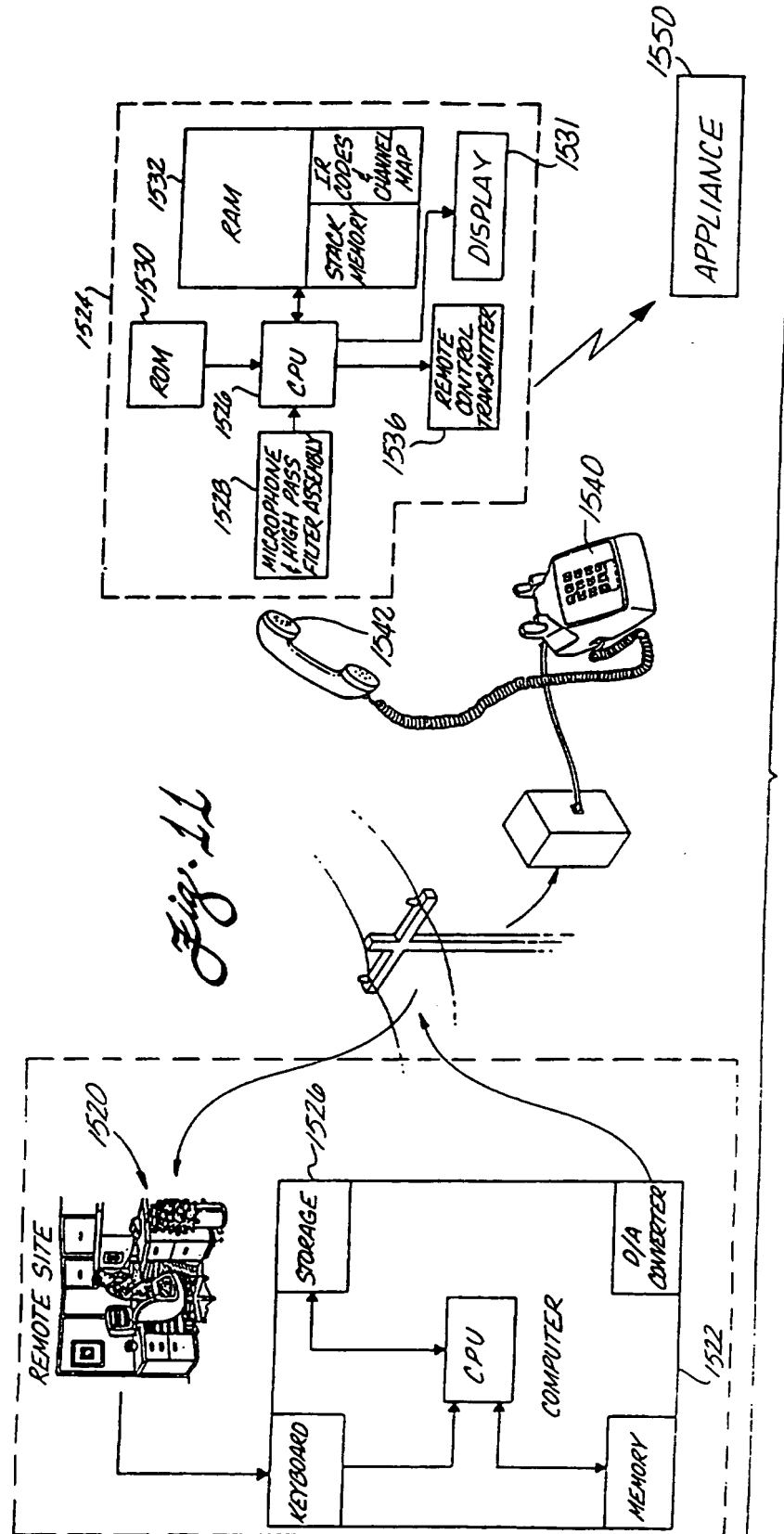
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Fig. 12

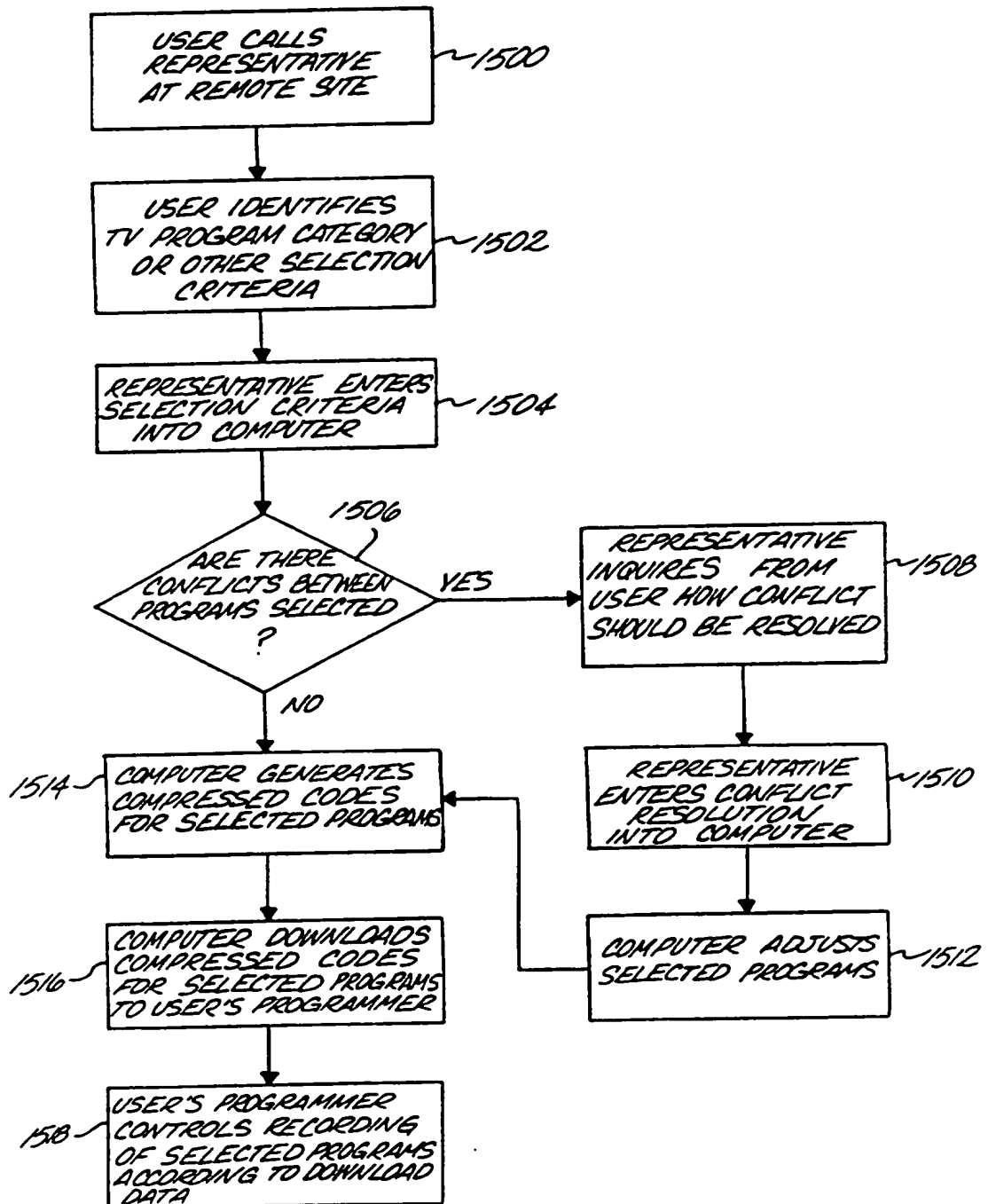
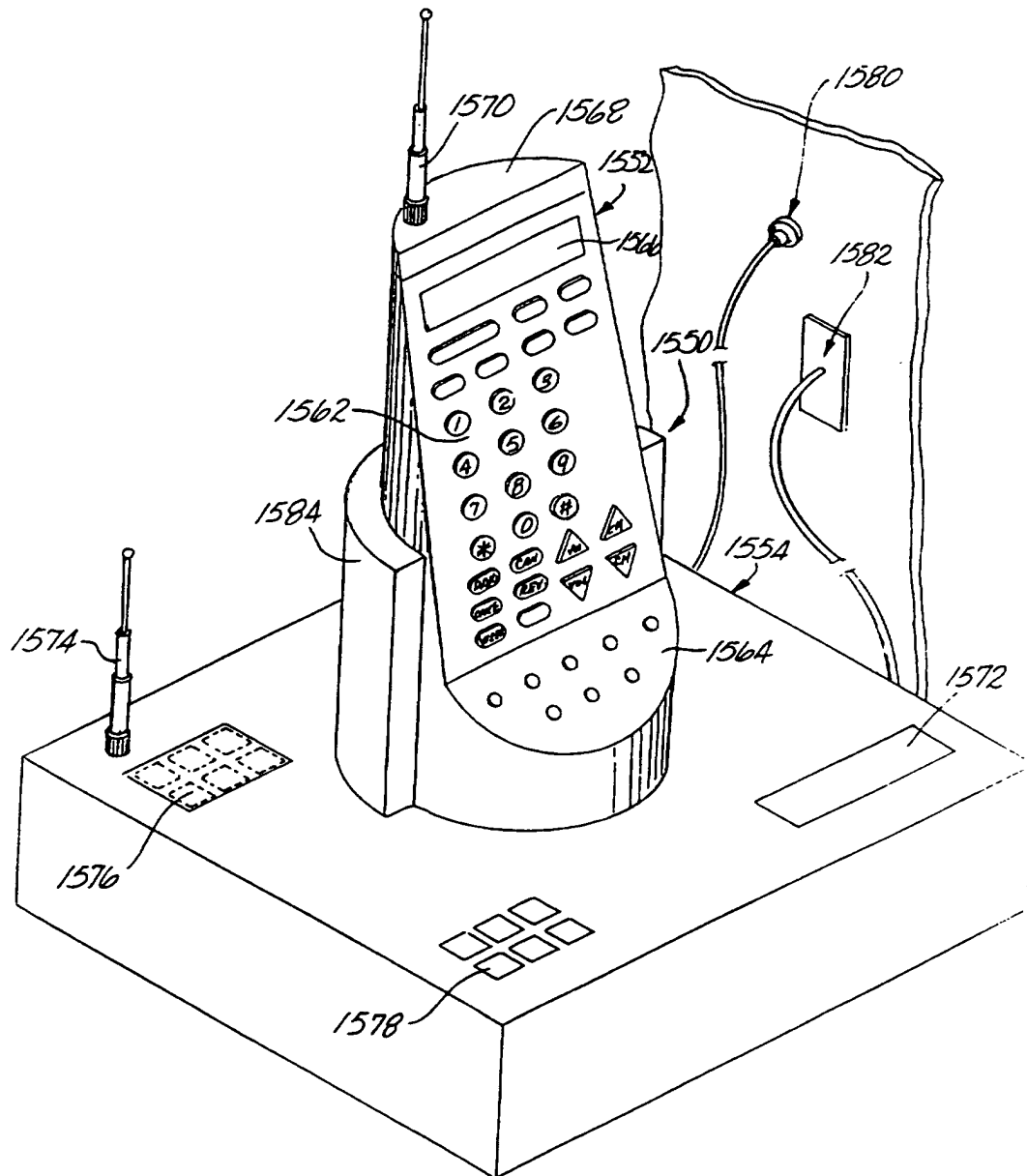
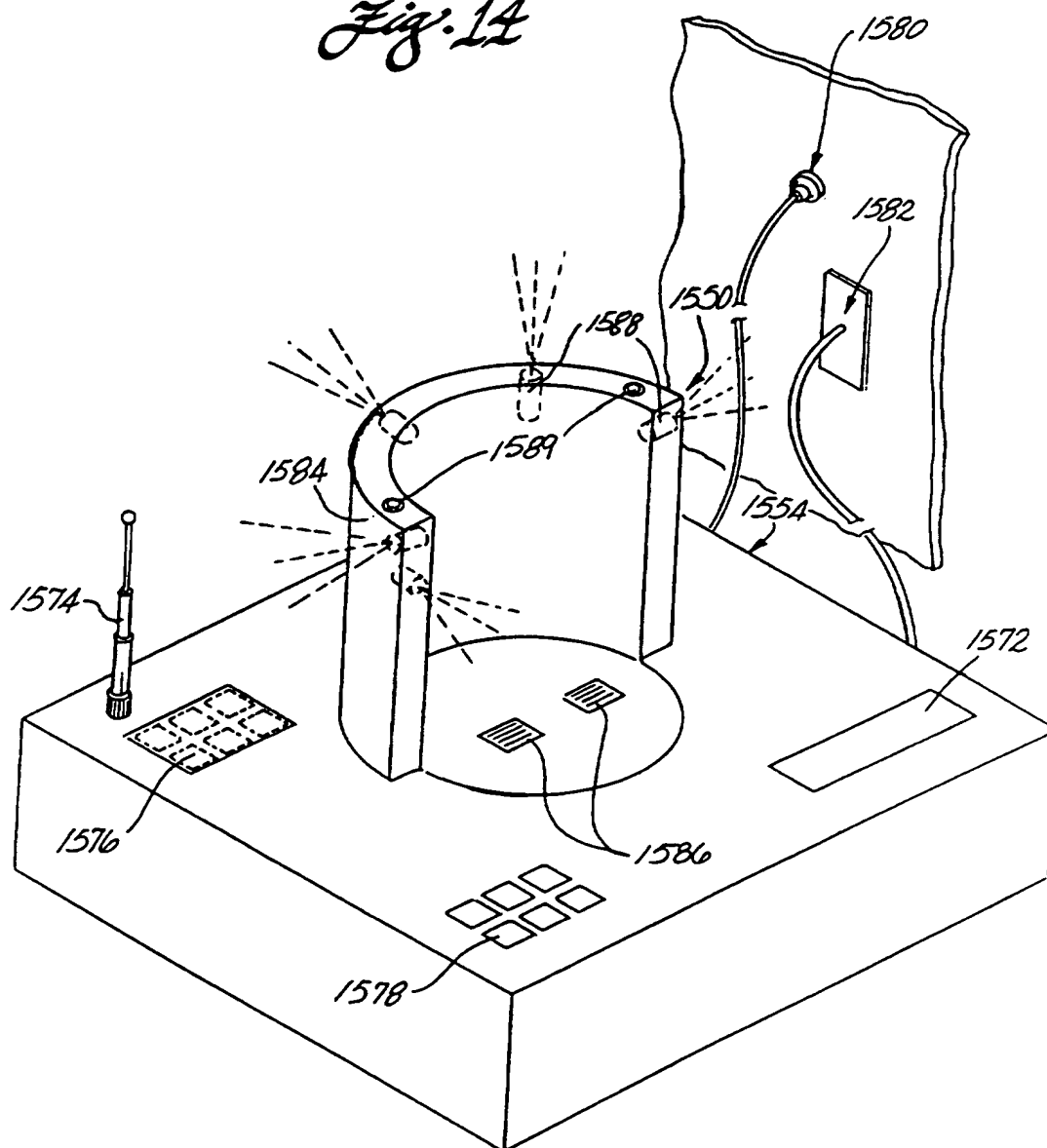
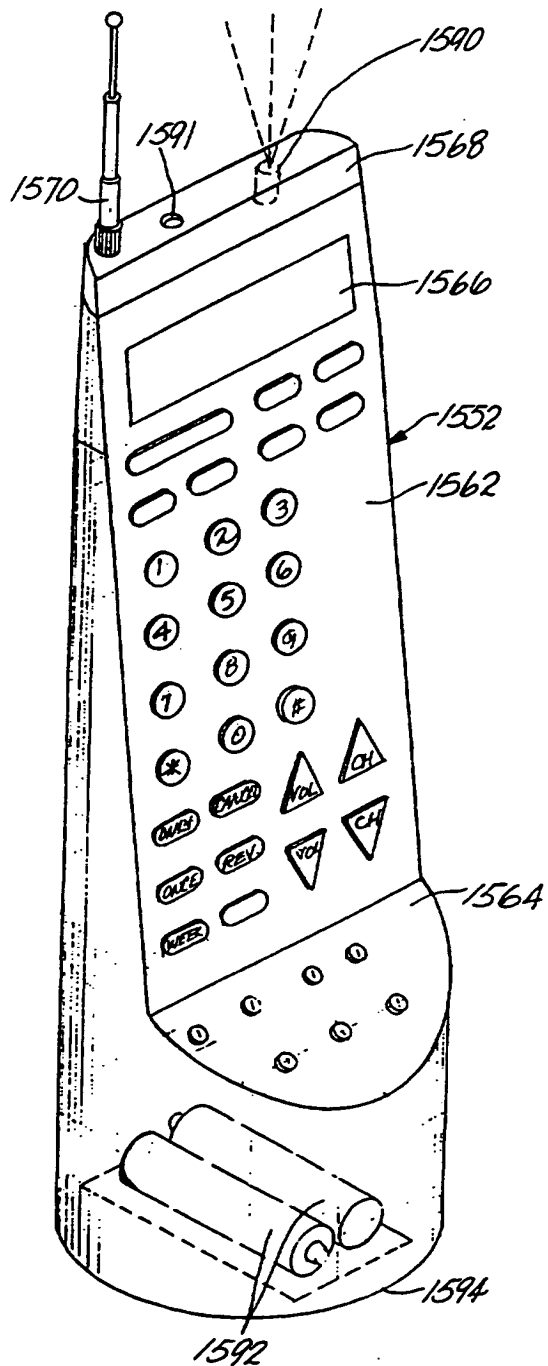
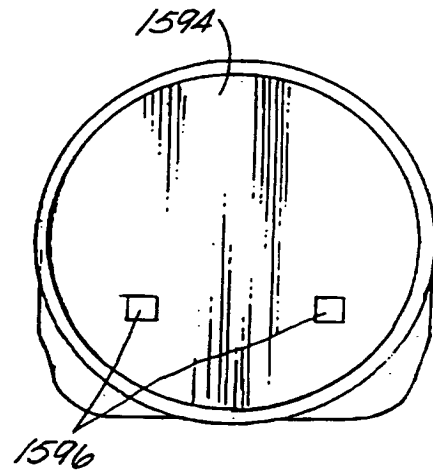


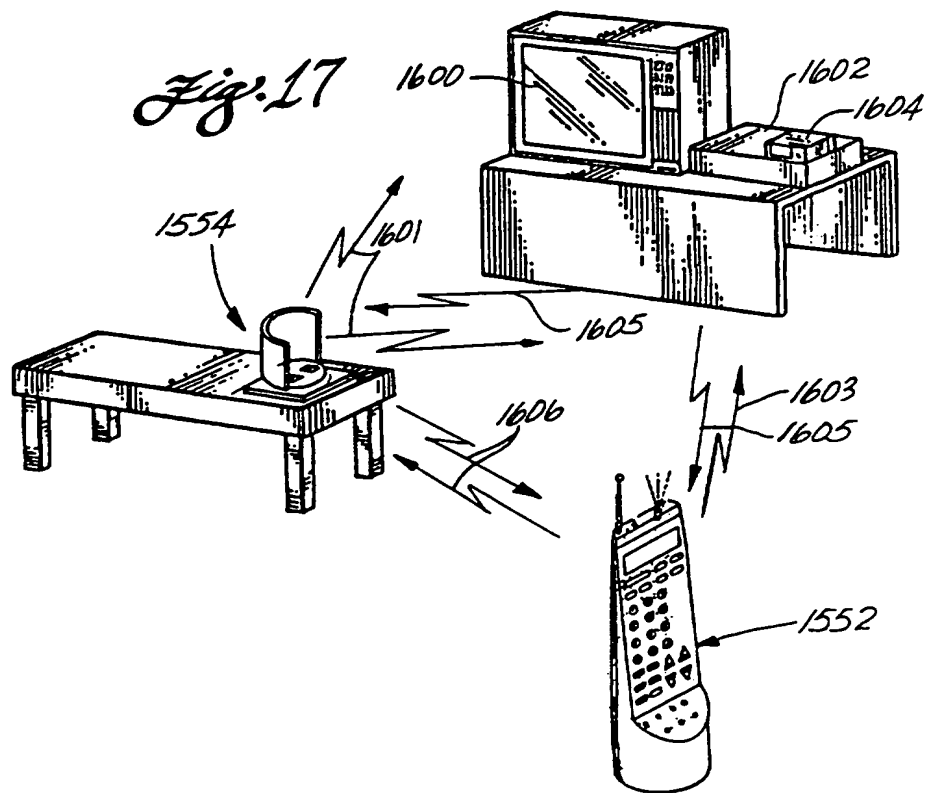
Fig. 13



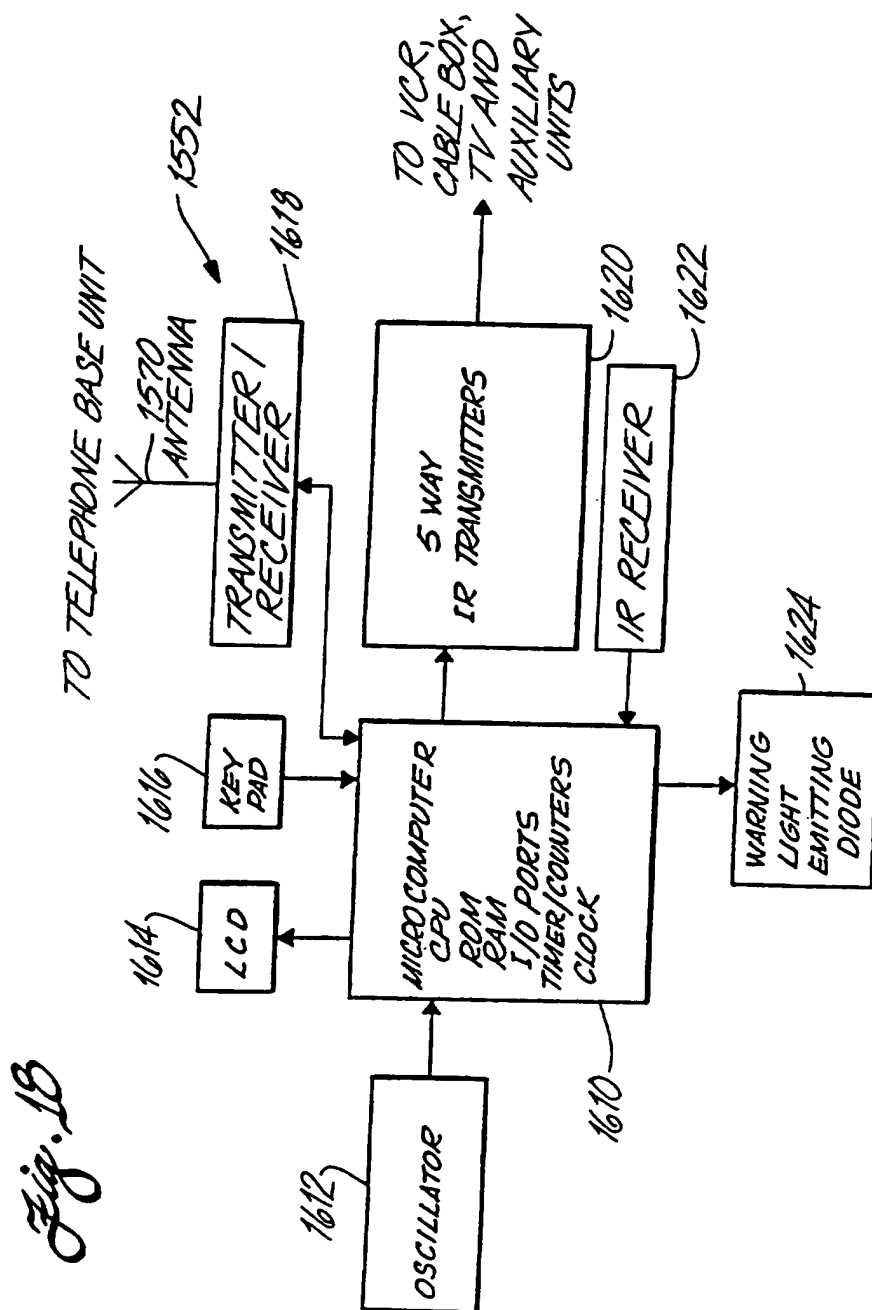
*Fig. 14*

*Fig. 15**Fig. 16*

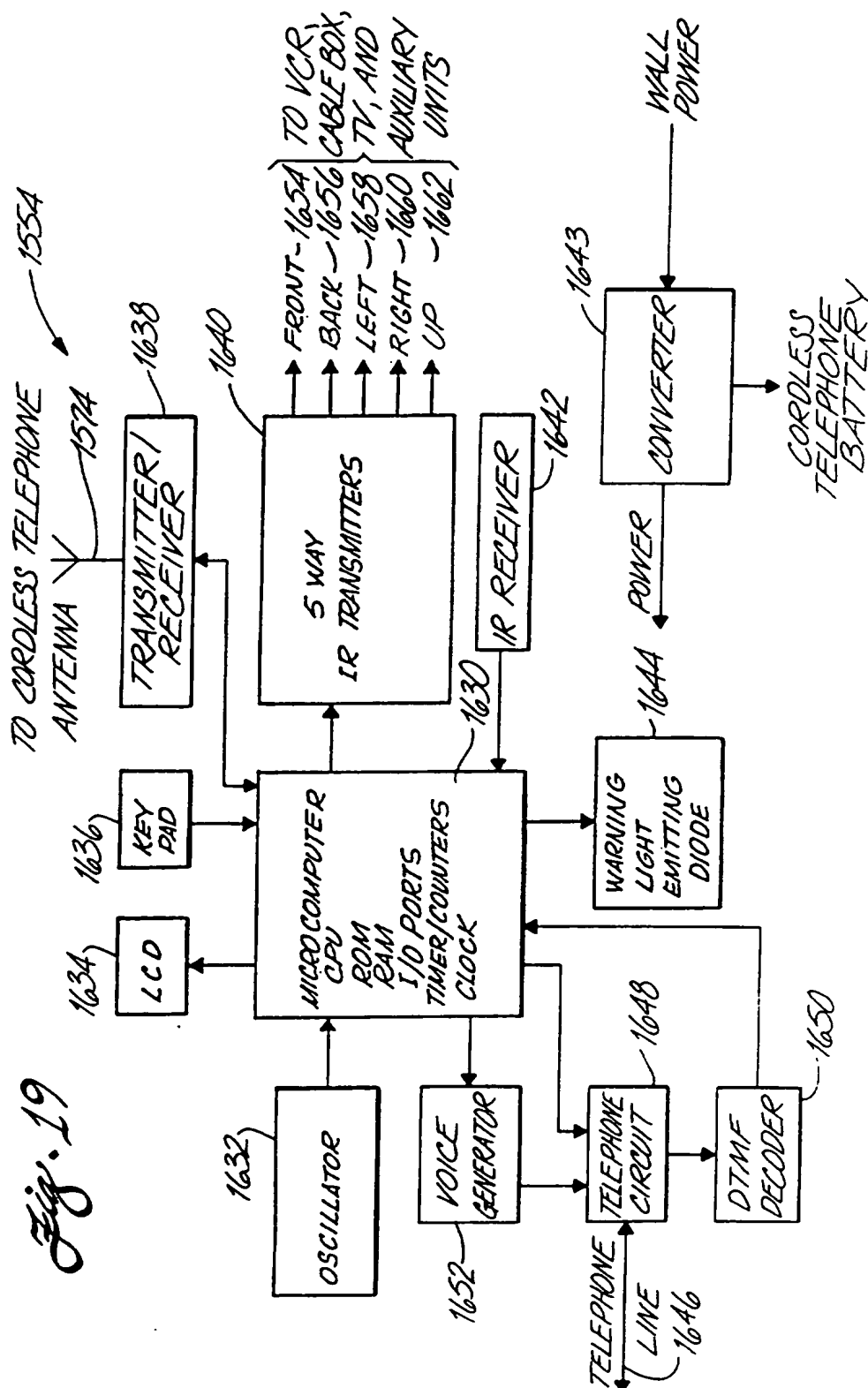




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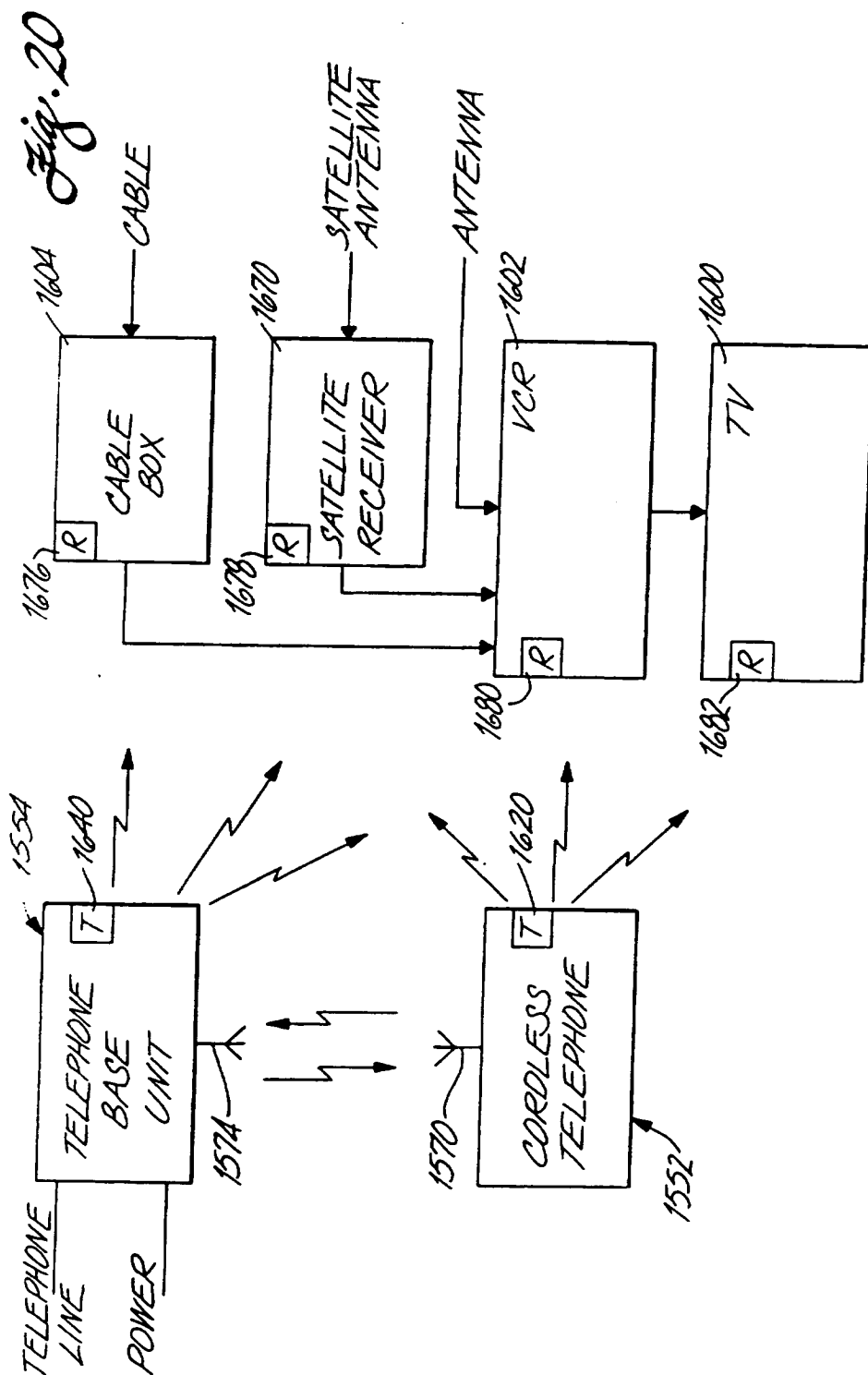


Fig. 21

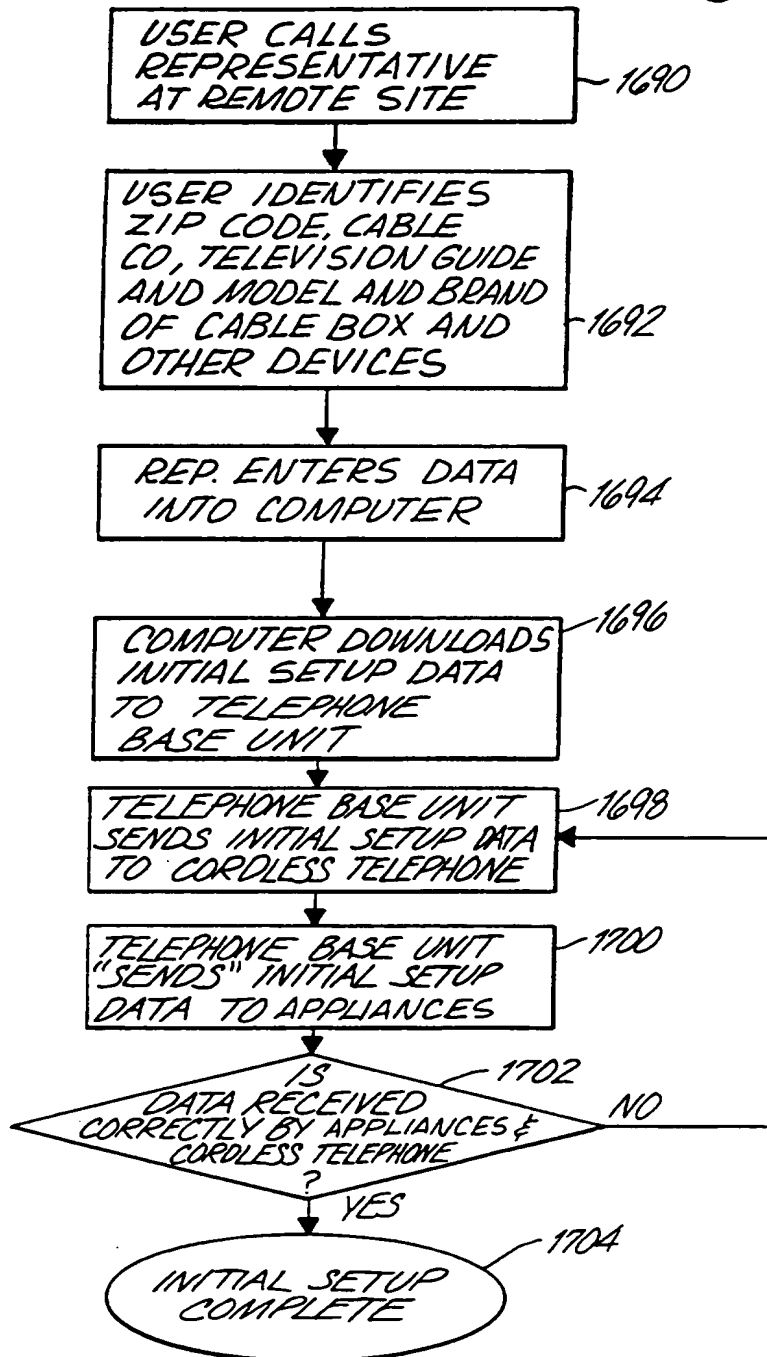
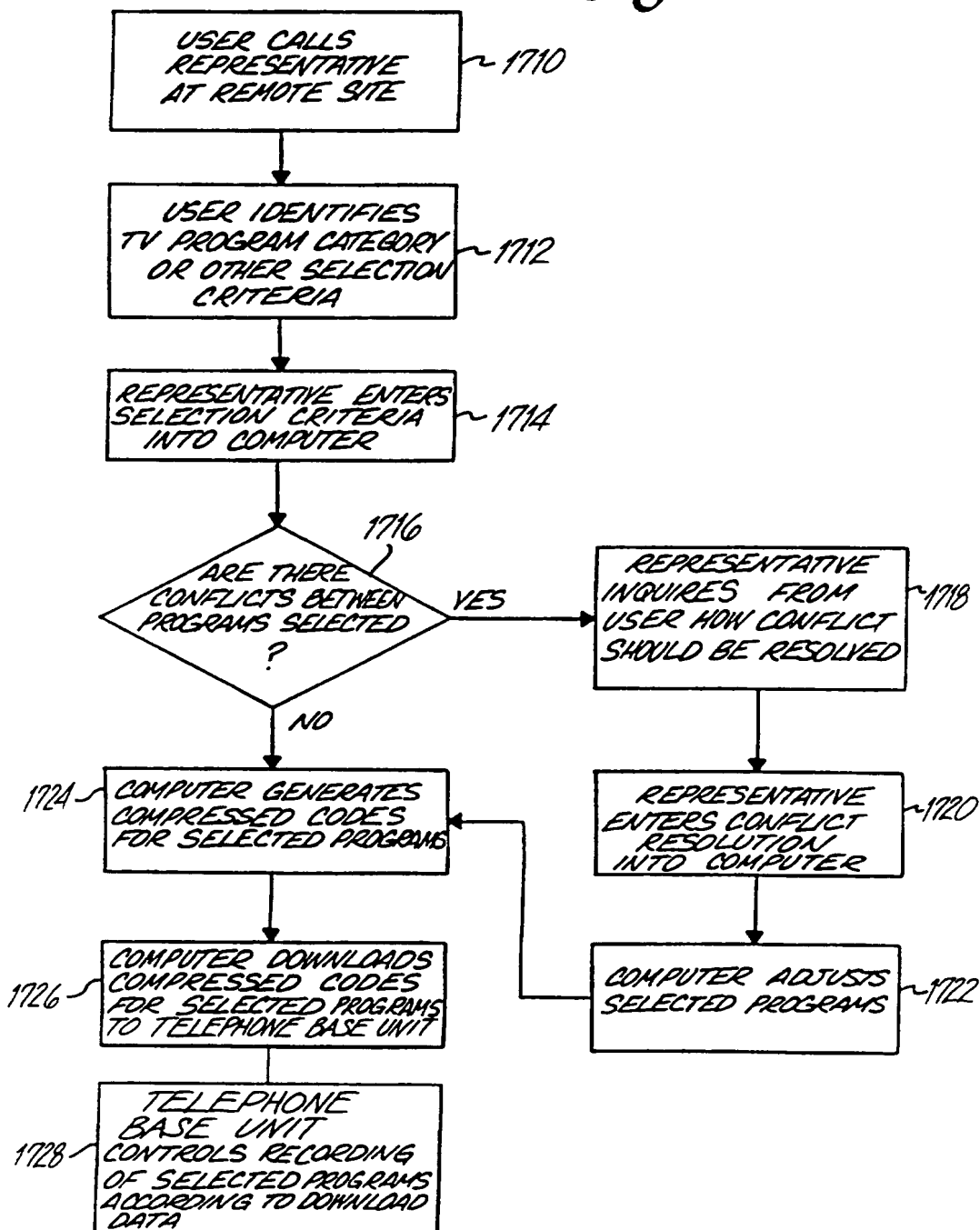


Fig. 22



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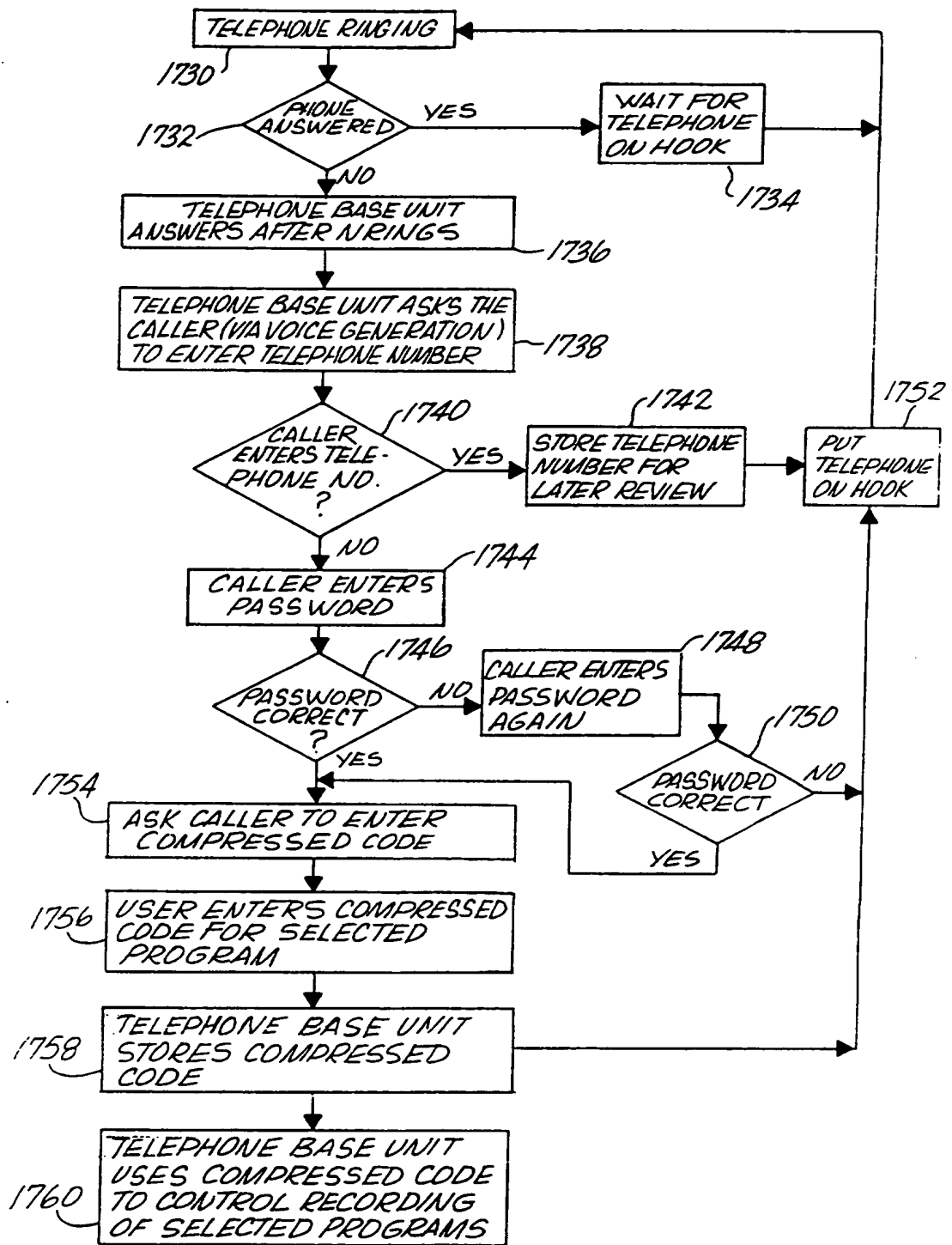
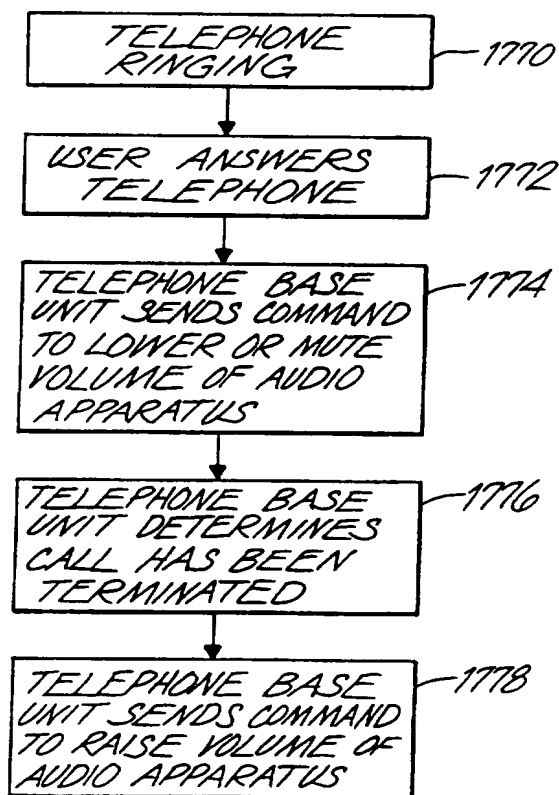


Fig. 23

*Fig. 2A*



*Fig. 25*

PRIOR ART

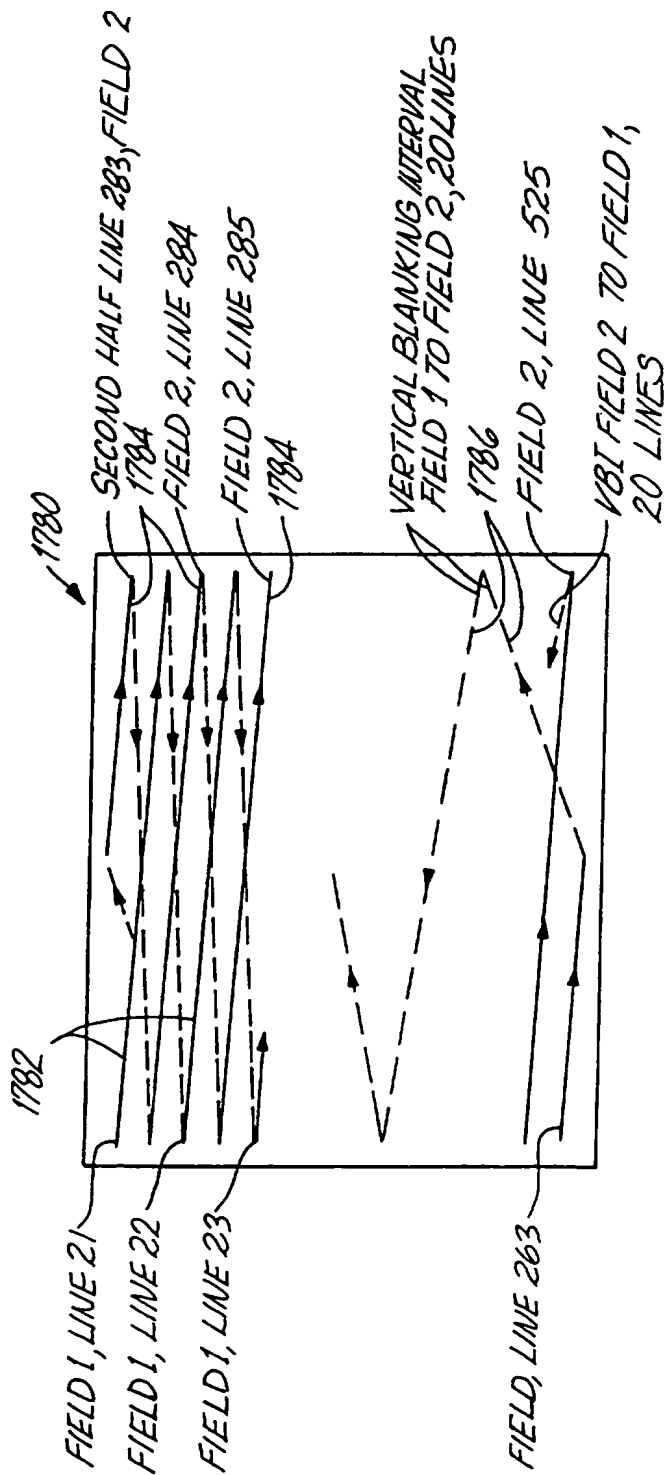
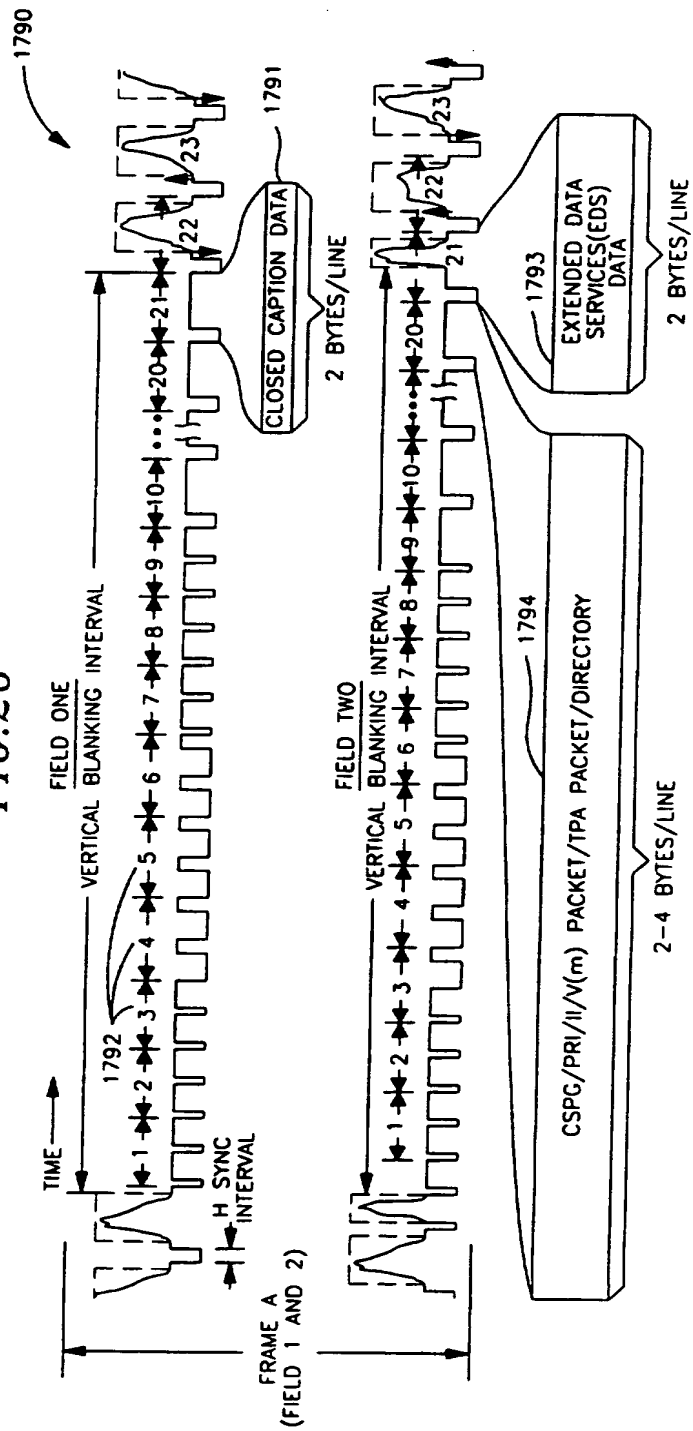


FIG. 26





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Fig. 28

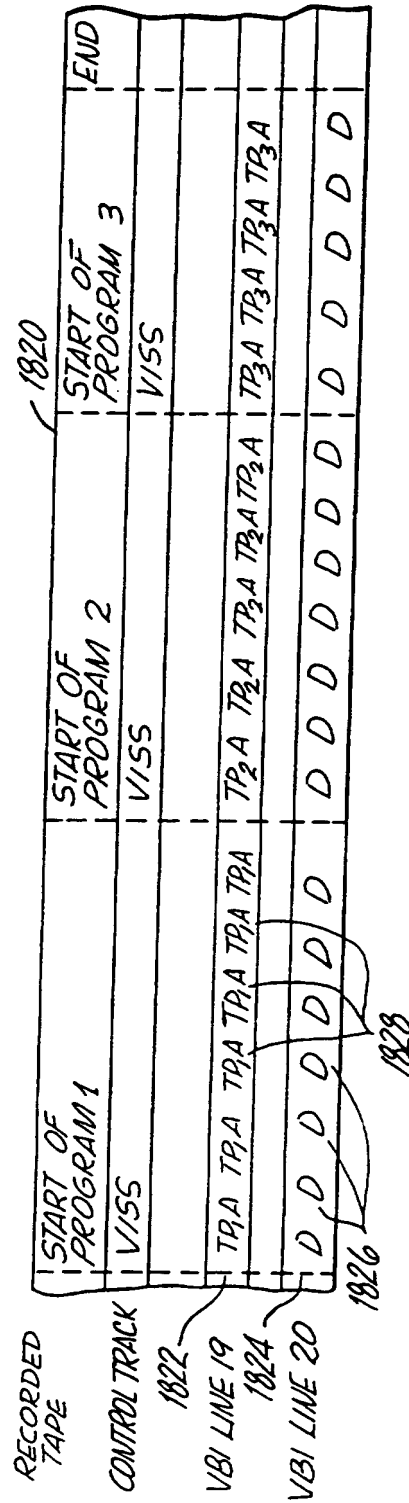


Fig. 29A

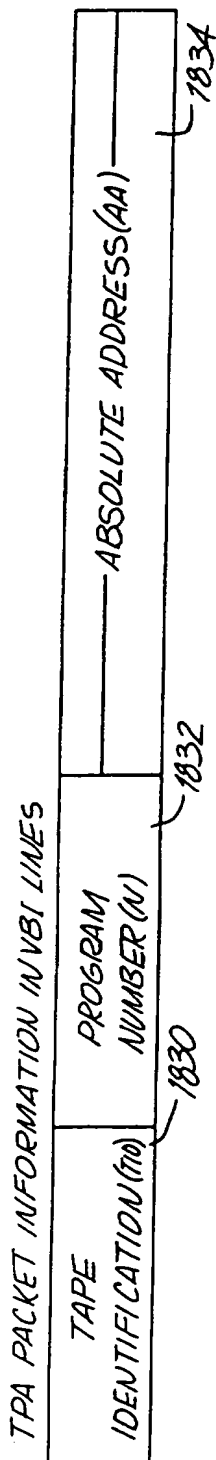
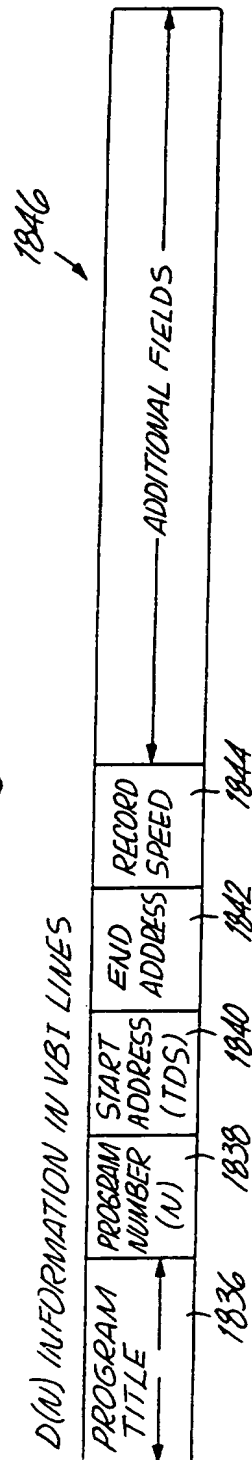


Fig. 29B



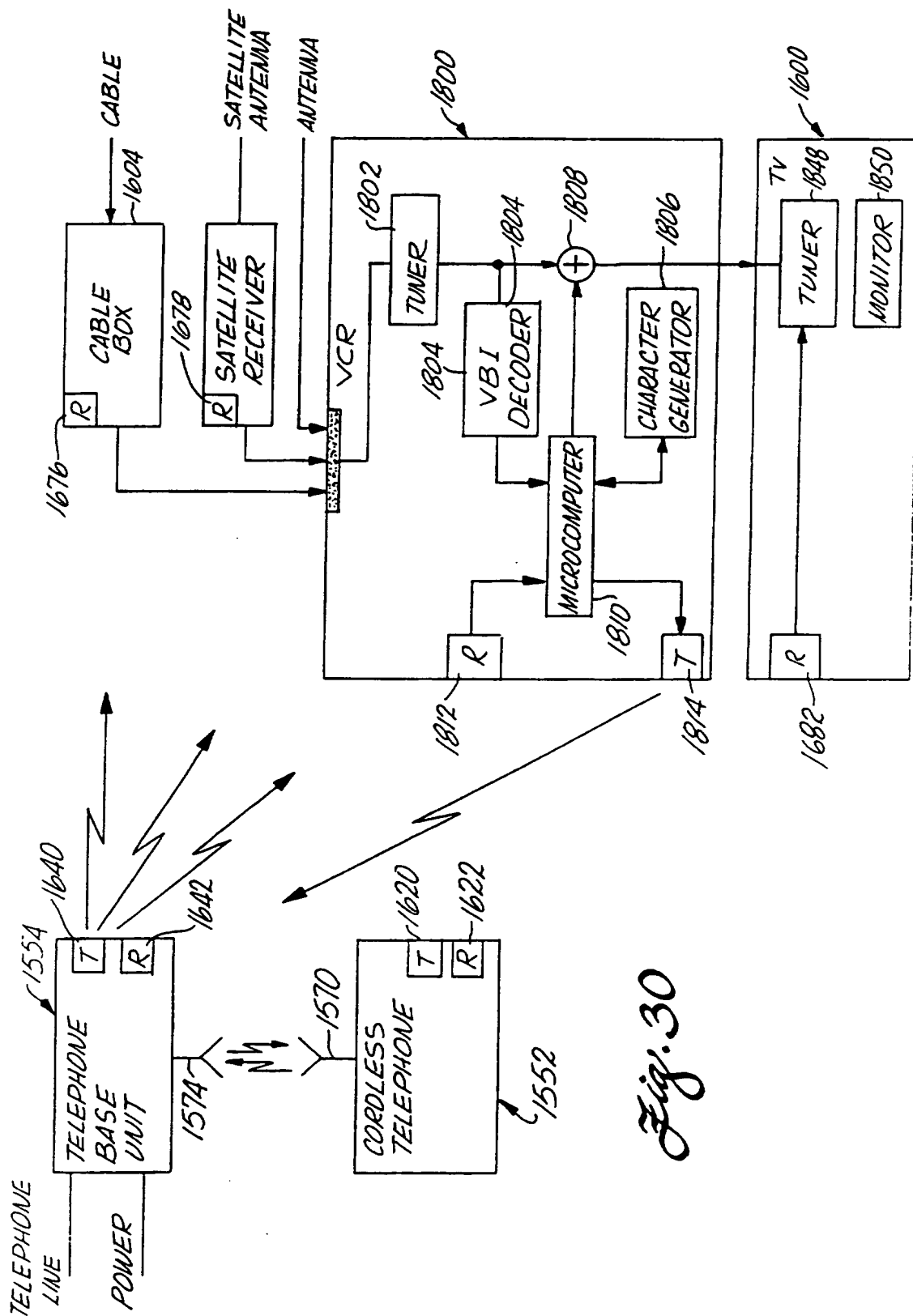
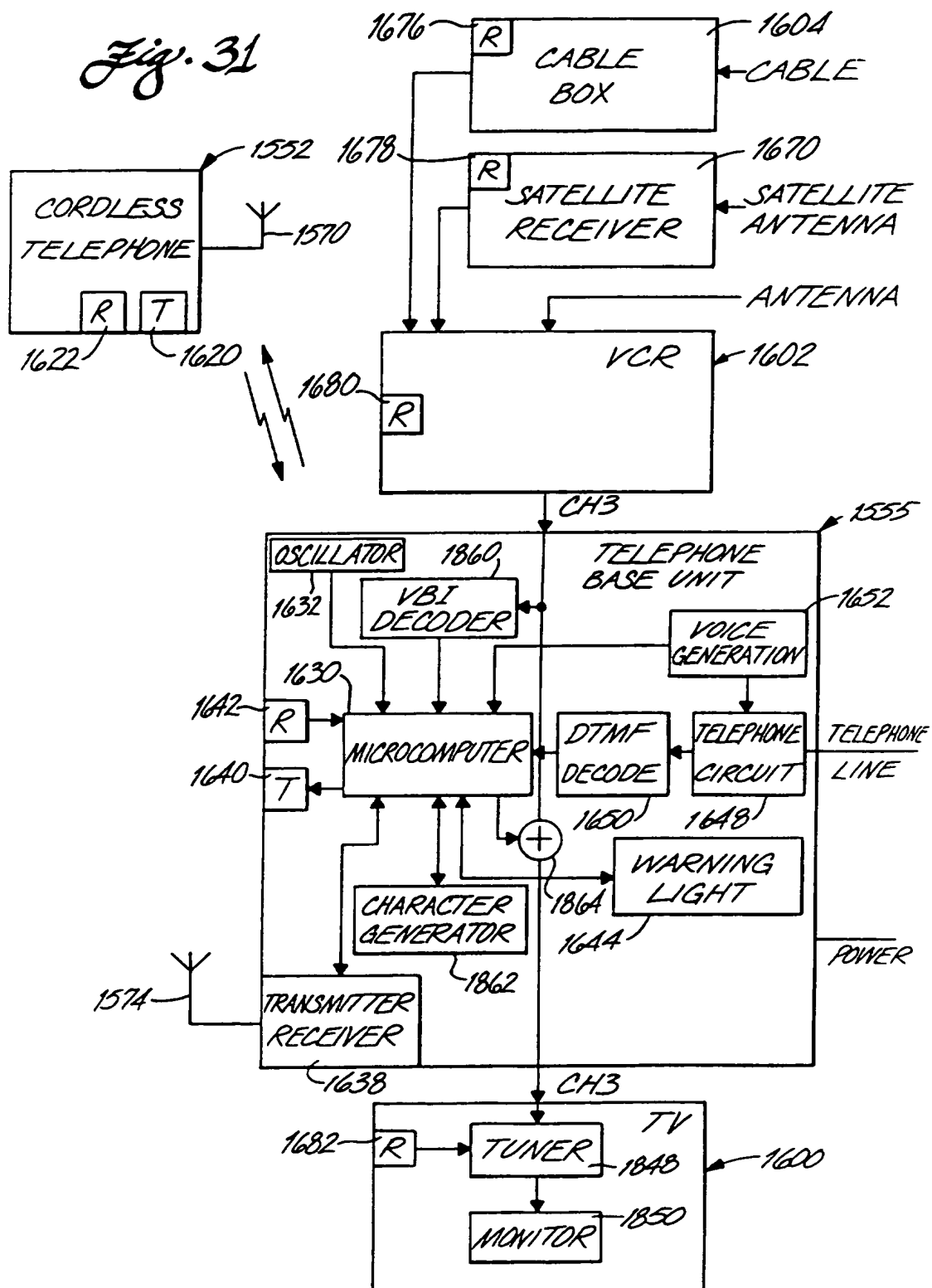
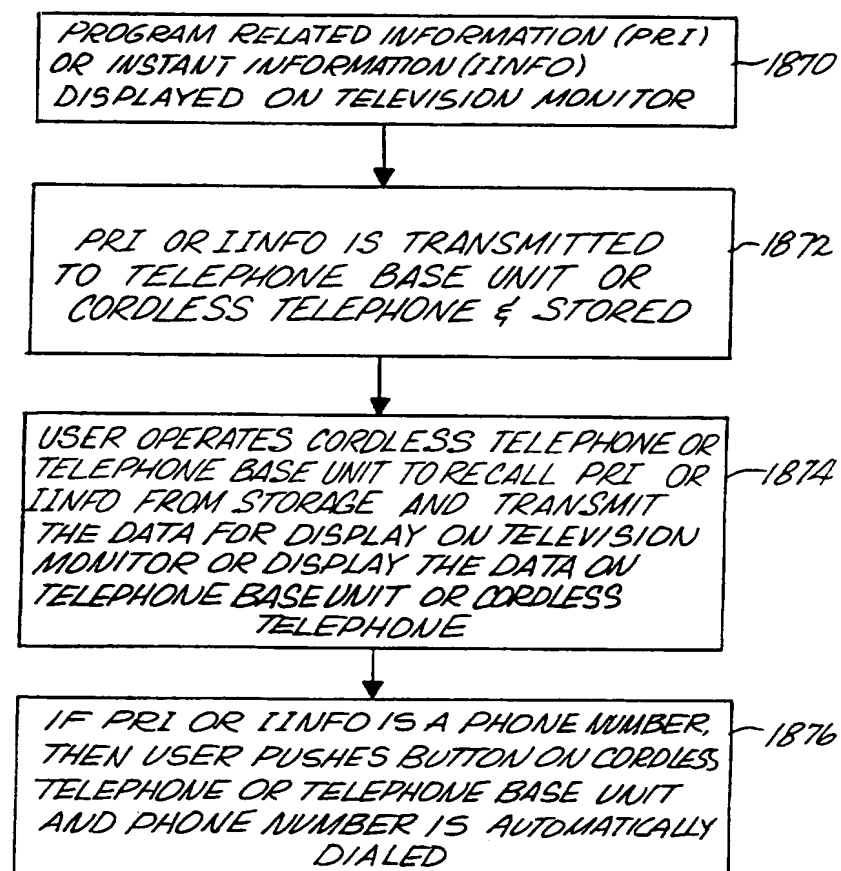


Fig. 30

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Fig. 31



*Fig. 32*



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US95/14159

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : H04N 5/76

US CL : 358/335

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : Please See Extra Sheet.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS

search terms: cordless, telephone, and infrared.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,899,370 (KAMEO ET AL.) 06 February 1990, Fig. 3 and its respective disclosure.	1-31 and 41-54
Y	CA, A, 2,005,070 (YUEN ET AL.) 23 June 1990, Fig. 1.	1-79
Y	US, A, 4,456,793 (BAKER ET AL.) 26 June 1984, column 1.	5-7, 10-11, 18, 20, 23, 37-38, 41-54, and 60-61
X	US, A, 4,625,080 (SCOTT) 25 November 1986, columns 2-5.	35-36
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Y		32-34, 37-38, and 55-75



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	* T	later documents published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
* A* document defining the general state of the art which is not considered to be part of particular relevance	* X	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
* E* earlier document published on or after the international filing date	* Y	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
* L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	* &	document member of the same patent family
* O* document referring to an oral disclosure, use, exhibition or other means		
* P* document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

17 JANUARY 1996

Date of mailing of the international search report

15 FEB 1996

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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US95/14159

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	2244 Research Disclosure, No. 329, Emsworth, GB, issued September 1991, "Installation of Consumer Apparatuses", the whole document.	39-40
Y	US, A, 4,908,707 (KINGHORN) 13 March 1990, Fig. 3.	76-79
A	US, A, 4,866,434 (KEENAN) 12 September 1989, Fig. 4.	1-79
A	US, A, 4,977,455 (YOUNG) 11 December 1990, Fig. 1.	1-79

Form PCT/ISA/210 (continuation of second sheet)(July 1992)\*

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US95/14159

## B. FIELDS SEARCHED

Minimum documentation searched

Classification System: U.S.

U.S.: 358/335, 310, 342; 348/731, 732, 733, 734; 455/150.1, 171.1, 179.1, 180.1, 181.1, 185.1, 186.1, 186.2;  
360/33.1, 69; 379/102, 104, 105.

IPC: H04N 5/76, 5/92, 5/44, 5/50.

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